

Feb 11 '47

117

THE

FEBRUARY, 1947

Refrigeration

AIR CONDITIONING
EQUIPMENT

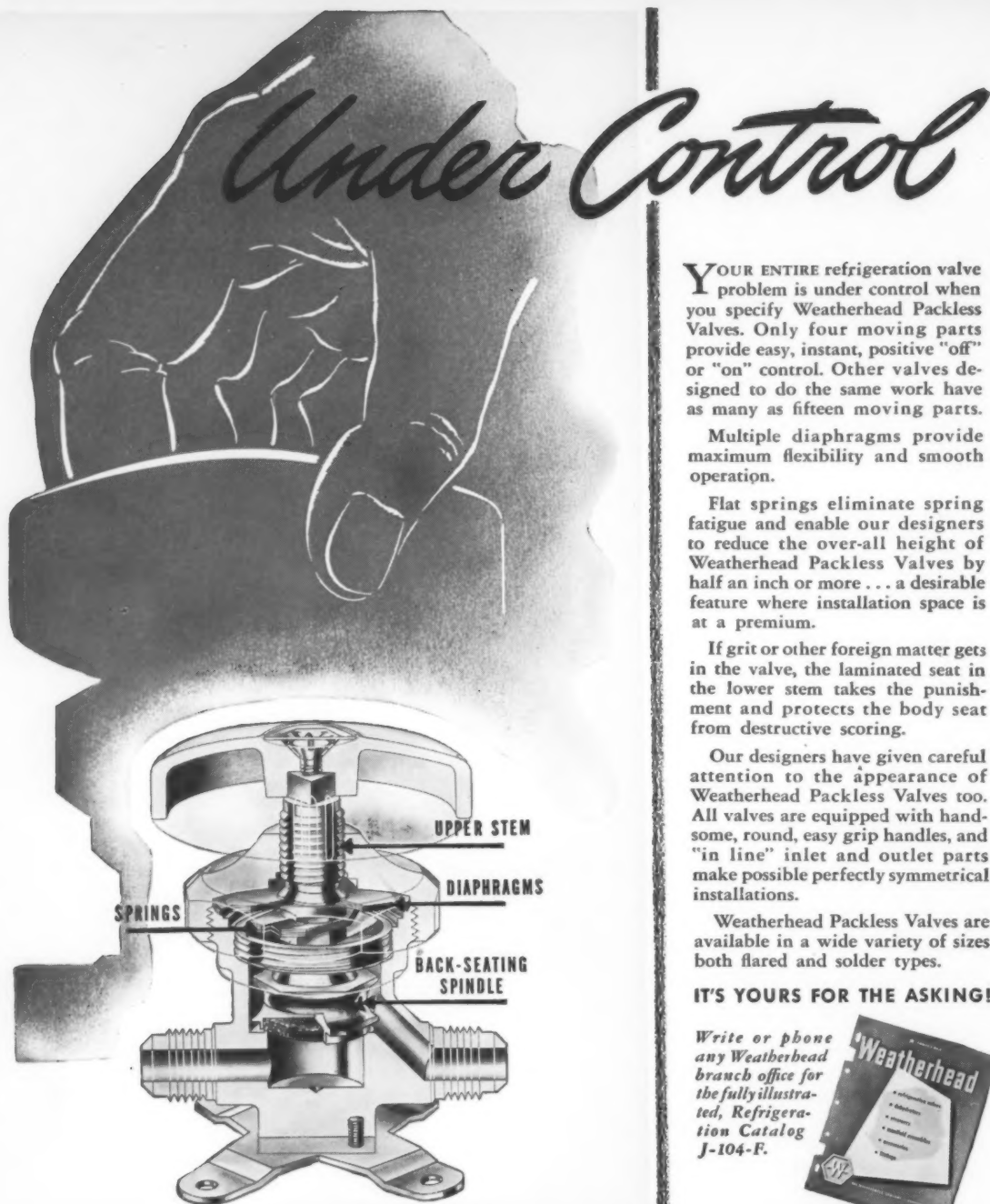
INDUSTRY

MERCHANDISING * INSTALLATION * MAINTENANCE



IN THIS ISSUE:

{ Income Tax Deductions ... and How to Make the Most of Them
Practice What You Preach ... Thermostatic Expansion Valves
Defrost Systems ... Determination of Supply Air Conditions



Look Ahead with

Weatherhead

THE WEATHERHEAD COMPANY, CLEVELAND 8, OHIO



NEW YORK • DETROIT • CHICAGO • ST. LOUIS • ATLANTA • DALLAS • LOS ANGELES

YOUR ENTIRE refrigeration valve problem is under control when you specify Weatherhead Packless Valves. Only four moving parts provide easy, instant, positive "off" or "on" control. Other valves designed to do the same work have as many as fifteen moving parts.

Multiple diaphragms provide maximum flexibility and smooth operation.

Flat springs eliminate spring fatigue and enable our designers to reduce the over-all height of Weatherhead Packless Valves by half an inch or more . . . a desirable feature where installation space is at a premium.

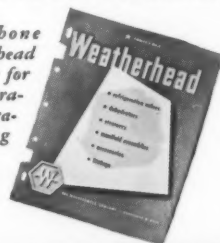
If grit or other foreign matter gets in the valve, the laminated seat in the lower stem takes the punishment and protects the body seat from destructive scoring.

Our designers have given careful attention to the appearance of Weatherhead Packless Valves too. All valves are equipped with handsome, round, easy grip handles, and "in line" inlet and outlet parts make possible perfectly symmetrical installations.

Weatherhead Packless Valves are available in a wide variety of sizes both flared and solder types.

IT'S YOURS FOR THE ASKING!

Write or phone any Weatherhead branch office for the fully illustrated, Refrigeration Catalog J-104-F.

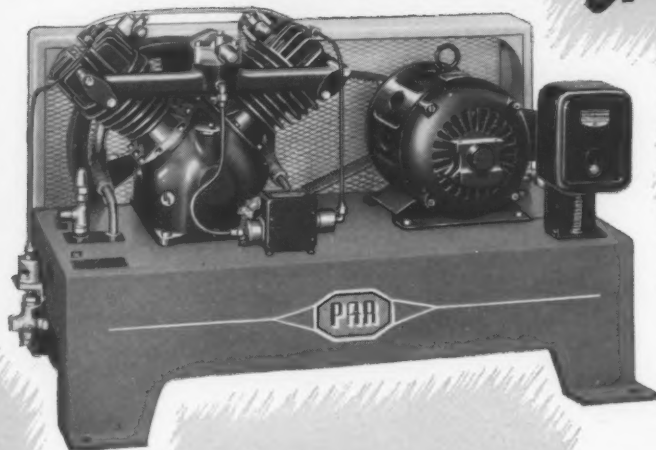


ATTENTION REFRIGERATION ENGINEERS!

We manufacture valves, dehydrators, strainers, manifold assemblies, accessories and fittings—an extensive line of original equipment for the refrigeration industry.



**CHECK the PAR EXTRAS
and SEE the
BIG DIFFERENCE**



PAR—Condensing Unit Line sold exclusively through Franchised Refrigeration Equipment Wholesalers!

Year after year, new features, new improvements, new refinements, backed by engineering know-how, are added to the Par line. Today Par Refrigeration Equipment is tops in economy, efficiency and dependability. Check these Par Extras with your Par wholesaler, and see the big difference.

Lynch . . . By Comparison — You'll Buy **PAR**
Manufacturing Corporation
General Offices, Toledo 1 • Factory, Defiance, Ohio, U.S.A.

Magnet cures headache



Emilia Bojanowski
J & H Associate,
Plant No. 3

Extra values through **JACK & HEINTZ** Mass Precision

Magnetizing of Magnetos usually

takes five operations: (1) assemble magneto, (2) adjust bearings, (3) disassemble magneto, (4) magnetize

rotor, (5) reassemble magneto. Operations (3) and (5)

were production headaches. These were eliminated by Jack & Heintz engineers who developed a giant magnetizing device by which the rotors are magnetized through the magneto frame . . . *after* assembly. Result: higher quality and faster production of urgently-needed Eisemann magnetos.

Achievements of Jack & Heintz *mass precision* such as this are creating extra values in magnetos, electric motors, bearings, refrigeration compressors and aircraft accessories *today* and in revolutionary developments for *tomorrow*.

JACK & HEINTZ PRECISION INDUSTRIES, INC., Cleveland 1, Ohio

THE Refrigeration INDUSTRY

VOLUME 4, NO. 2

THIS MAGAZINE has no official affiliation with ANY group, society or association.

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CCA

THE COVER . . . Typical of the way in which the refrigeration industry is once again "delivering the goods" in mass quantities is this production-line testing laboratory for home and farm freezers in the plant of Ben Hur Mfg. Co., Milwaukee, Wis. For further information on this laboratory, turn to the news story on page 47.

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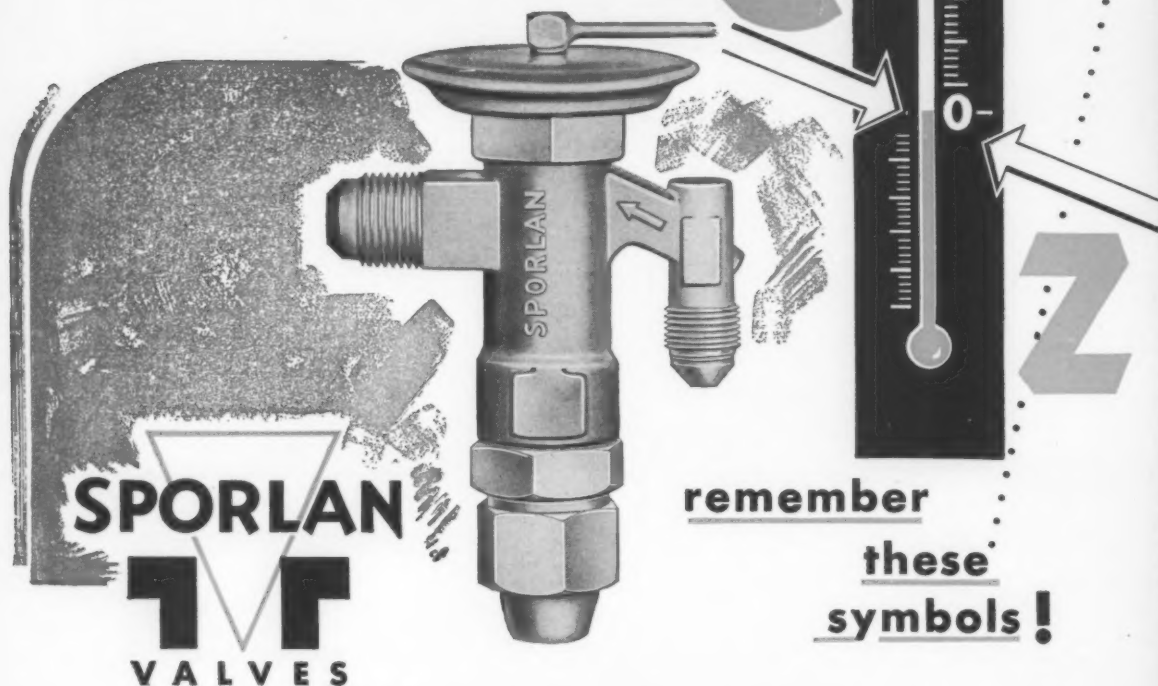
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REFRIGERATION PUBLICATIONS, INC., Cleveland, Ohio
IRVING B. HEXTER, President LESTER P. AURBACH, Vice President

For PEAK PERFORMANCE

On All Refrigeration Installations . . .



SPORLAN "C" CHARGE FOR SUCTION TEMPERATURES **Above** ZERO

SPORLAN "Z" CHARGE FOR SUCTION TEMPERATURES **Below** ZERO

Your Sporlan wholesaler stocks the full line of Thermostatic Expansion Valves with Selective Charges to meet any operating conditions. Always consult with him before ordering and be assured of peak performance on all installations.

Sporlan Manufactures

SOLENOID VALVES
SOLENOID PILOT CONTROLS
MODULATING PILOT CONTROLS
REFRIGERANT DISTRIBUTORS
STRAINERS, CATCH-ALLS
and the only
THERMOSTATIC EXPANSION VALVES
with SELECTIVE CHARGES

Use a Sporlan Catch-All on every job...The most
Perfect Filter-Dehydrater ever developed!

SPORLAN VALVE COMPANY

3723 COMMONWEALTH AVENUE

ST. LOUIS 17, MISSOURI

NEW STANDARDS of PERFORMANCE

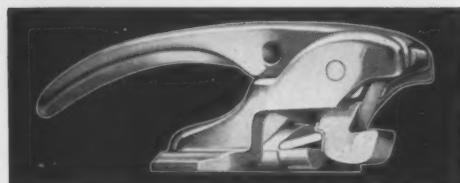
... based on
Superior DESIGN and
Astute ENGINEERING



When it Trips, it GRIPS

It may be quite incidental that this lock incorporates a new, exclusive principle . . . that its action provides the strongest, most positive locking grip ever devised . . . that it operates at the touch of a finger . . . that it's available in a variety of sizes.

You are most interested in the long, trouble-free service it gives . . . in your customer's approval . . . in the credit it reflects upon your product and your company. And you always earn these extra dividends when you specify Grand Rapids Brass Company hardware.



EXTRA ENDURANCE... FOR DAILY COMMERCIAL ABUSE

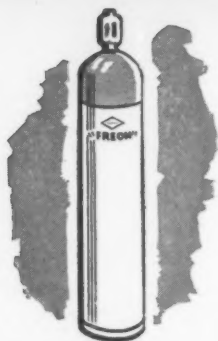
Every working part is designed to cushion shock. The rugged trigger-latch (A, B) is shaped for a direct blow on the strike, spring-cushioned through an off-center plate (C). The bolt (D) is short and heavy taking all stresses in one direction against a powerful coil spring. Engineered for many years of extra service on your commercial applications!

America's Quality Line of
**COMMERCIAL REFRIGERATOR
HARDWARE**

Grand Rapids Brass Company

Makers of Dependable Refrigerator Hardware for over 40 Years

Grand Rapids 1, Michigan



WANTED NOW!

Empty "FREON" Cylinders

USERS OF "Freon" Safe Refrigerants are urgently requested to check all "Freon" cylinders on hand and to return empty cylinders at once—today, if possible!

Empties are badly needed to meet the greatly increased demand for "Freon."

Shortage of cylinders in

which to ship "Freon" has resulted from reduced deliveries of new cylinders . . . due to scarcity of raw materials, chiefly steel. One way to bridge the emergency . . . continue meeting tremendous demands for "Freon" . . . is to utilize every available "Freon" cylinder. So

won't you *please* check all cylinders you have on hand and return the empties **NOW**.



➡ *This handy memo may help you expedite matters . . . please relay it to the proper person or department.* ➡

(TEAR FROM CENTER AND ALONG THIS LINE)

**URGENT
MEMO**

To: _____

The "Freon" people have asked us to help meet a very serious shortage of cylinders. Please check all cylinders we have on hand and arrange to return empty "Freon" cylinders immediately.

Ship empty "Freon" cylinders via freight collect to:-

Kinetic Chemicals, Inc.
Carney's Point, New Jersey

THOUGHTS FOR MERCHANDISERS



You've poured time, trouble *and* money into building a loyal trade of profitable customers. Don't let a single one slip away because he's down on the service your equipment renders. Nothing contributes more to the service value of your products than dependable refrigeration units. And, for many years, the "buy-word" for dependable refrigeration has been BRUNNER condensing units. When you stop to think that one good customer is worth much more to you each year than the cost of a BRUNNER unit, you can see the wisdom of equipping with the best.

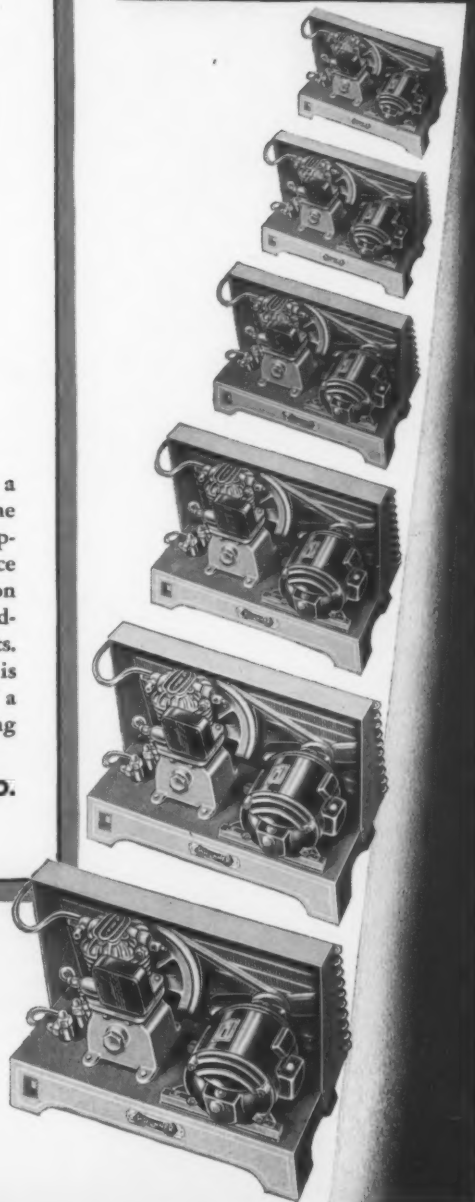
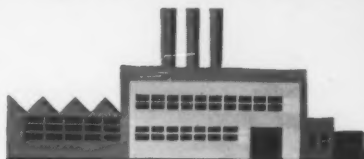
BRUNNER MANUFACTURING CO.

Utica 1, New York, U. S. A.

**AIR AND WATER COOLED MODELS
1/4 HP. TO 25 HP.**

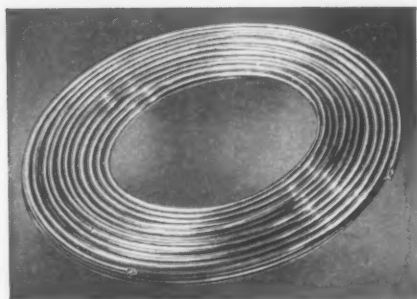
BRUNNER
SINCE 1906

REFRIGERATION helps you serve better





DRY AS SAHARA INSIDE



Revere Dryseal Copper Refrigeration Tube

A DESERT is wet compared to the interior of Revere Dryseal Tube. Here is one place where a little moisture could start a lot of trouble. Could collect at the orifice of an expansion valve and freeze there. Could obstruct the orifice or make the valve "stick" and lose control. Could become a costly nuisance to you and your customers alike.

That is why each length of Revere Dryseal is so carefully dehydrated during manufacture until its interior is bone dry, and why it is then immediately sealed at both ends to keep all moisture out. This tube is made of deoxidized copper (99.9+%) pure and is kept oxide-free by special processing methods. It is dead soft so that you can bend it and work with it easily.

Made for refrigeration, air conditioning, heat control and other exacting services,

Revere Dryseal is being shipped to distributors as rapidly as Revere can produce it without lowering its top standard of quality. It comes in sizes from $\frac{1}{8}$ " to $\frac{3}{4}$ " O.D. with .035" wall, and is standard in 50-foot coils. If you wish, a Revere Technical Advisor will gladly consult with you. Revere products are handled by leading distributors throughout the United States.

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, New York

Mills: Baltimore, Md.; Chicago, Ill.; Detroit, Mich.; New Bedford, Mass.; Rome, N. Y.—Sales Offices in Principal Cities, Distributors Everywhere



to Exploring the Unknown on the Mutual Network every Sunday evening, 9 to 9:30 p. m., EST.

Team up with ... PEERLESS

for efficient installations and profits

● PEERLESS is ready with a helping hand to give your installations efficiency—the way to fortify your position in a strongly competitive market. Use PEERLESS products as a sure means of producing customer satisfaction.



FINNED ICE CUBE MAKER



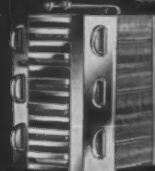
FIN COIL



EXPANSION VALVE



ICE CUBE MAKER



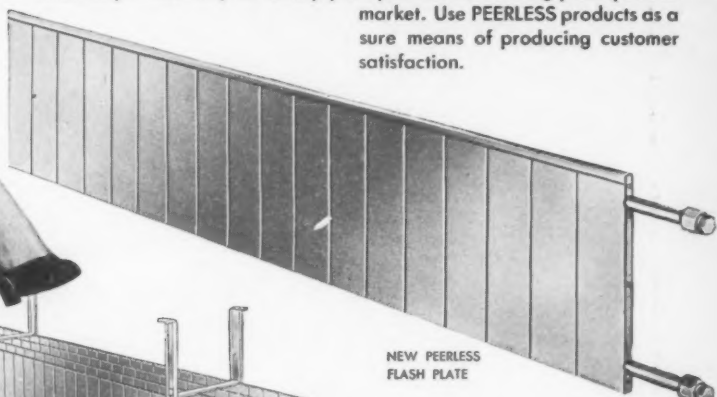
FINNED ICE CUBE MAKER



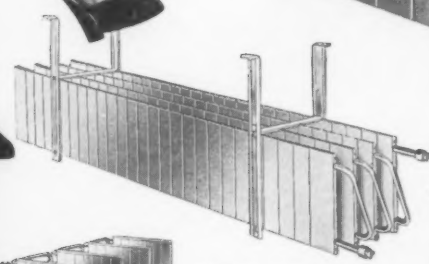
OFF CENTER COIL



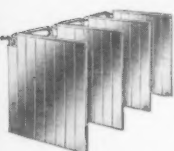
FLASH COOLER



NEW PEERLESS FLASH PLATE



PLATES IN BANK FORMATION

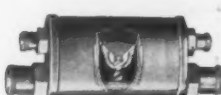


● PEERLESS FLASH PLATES are available NOW in QUANTITY for all low temperature applications such as locker plants, fixtures, domestic and commercial quick freezers, etc. Flat aluminum plates are mechanically bonded together by continuous copper or aluminum tubing. No joints—No leaks! Uniform distribution of refrigerant and non-ferrous high conductivity insure fast action and low operating cost. Aluminum provides own durable finish. Extreme light weight saves shipping costs.

● Make a PEERLESS CAPACITY BOOSTER a part of every installation! The marked increase in efficiency satisfies! New Model AA is precision engineered from seamless copper tubing with parallel connections throughout. Inlet and outlet liquid and suction connections are brazed by new process which banishes leaks. The exclusive PEERLESS THERMEK heat transfer surface is unrivaled in performance. Models B and C, for larger installations, incorporate like basic design. Every job, new or old, should be equipped with a PEERLESS CAPACITY BOOSTER.



NEW CAPACITY BOOSTER PACKAGE



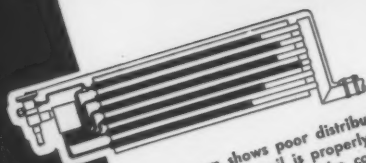
CAPACITY BOOSTERS

● Other PEERLESS products, illustrated at left, are designed to provide the highest degree of efficiency. The satisfaction your customers get NOW counts for future sales and profits—a solid reason for teaming up with PEERLESS!

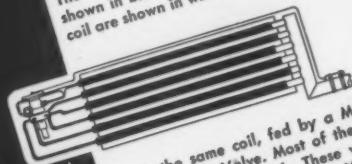
SOLD THROUGH LEADING REFRIGERATION SUPPLY WHOLESALERS

PEERLESS OF AMERICA, Inc.
General Sales Offices . . . 2901 Lawrence Ave., Chicago 25, Illinois

ALCO



This diagram shows poor distribution. Only part of the coil is properly fed. The working portions of the coil are shown in black. "Loafing" parts of the coil are shown in white.



This is the same coil, fed by a Multi-Outlet Thermo Valve. Most of the coil is now doing real work. These valves increase coil capacity up to 25%.

MULTI-OUTLET THERMO VALVES PUT LAZY CIRCUITS TO WORK ONE OUTLET FOR EVERY CIRCUIT



Poor refrigerant distribution that lets some circuits loaf often wastes $\frac{1}{3}$ to $\frac{1}{2}$ of coil capacity. The cure: install an ALCO Multi-Outlet Thermo Valve. It assures:

- The refrigerant liquid is accurately metered at the point of expansion to all coil circuits
- Even distribution regardless of load changes
- Constant full coil capacity—every circuit always on the job
- Accurate control—no "hunting" or "cycling"
- Longer "off" cycle—Lower operating cost

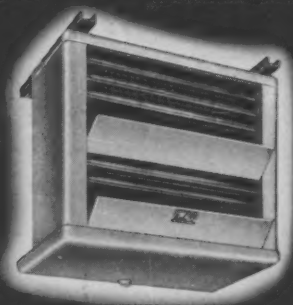
Available at your wholesaler's for all refrigerants, all requirements: $\frac{1}{2}$ to 50 tons FREON-12, 2 to 36 outlets. Ask for our Bulletin 180.



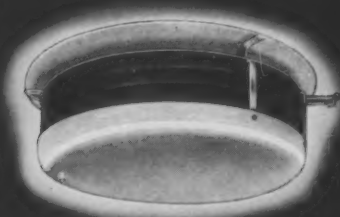
Designers and Manufacturers
of Thermostatic Expansion
Valves; Pressure Regulating
Valves; Solenoid Valves;
Float Valves; Float Switches.

ALCO VALVE CO.

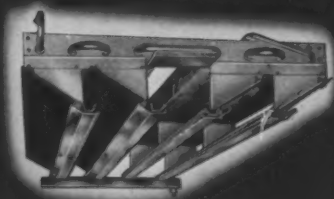
843 KINGSLAND AVE. • ST. LOUIS 5, MO.



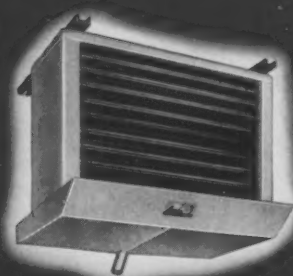
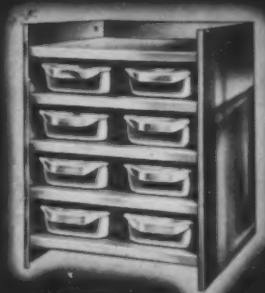
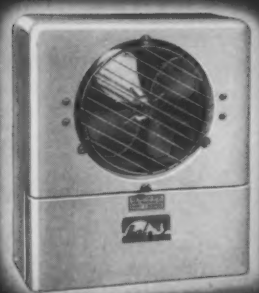
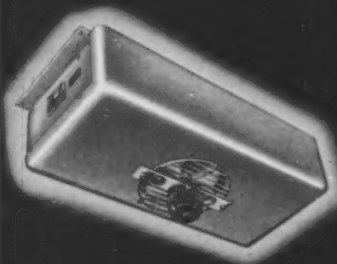
C-W UNIT COOLER—Wall- or ceiling-mounted



Jr. WALL-MOUNTED PANEL COOLER—compact... high capacity



STANDARD ICE-MAKING COILS—12- to 48-pound ratings



BUSH

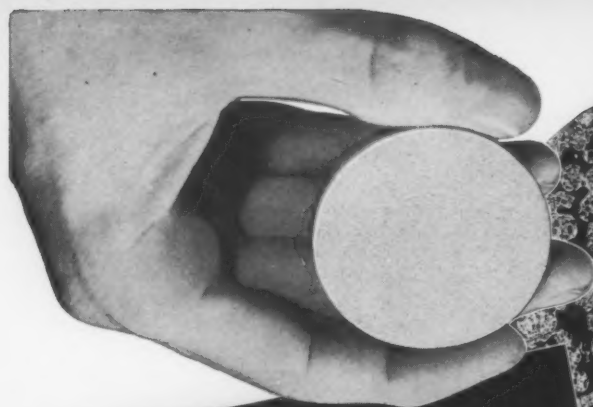
"BUSH" MEANS MORE BUSINESS . . . MORE PROFIT. The Bush name on equipment you sell is certain to result in more business from each customer . . . and from friends of those customers.

That's because owners of Bush equipment soon discover that these products require less servicing . . . that they are high on performance, low on operating cost.

To you, in addition to bringing new business, the Bush trademark also means that costly service calls won't eat up your profits. And that's worth thinking about when specifying equipment that you'll have to live with.

HEAT TRANSFER PRODUCTS • BUSH MANUFACTURING COMPANY • HARTFORD, CONN.

415 LEXINGTON AVE., NEW YORK • 549 W. WASHINGTON BOULEVARD, CHICAGO, ILLINOIS • EXPORT ADDRESS: 13 EAST 40th STREET, NEW YORK, N. Y. • CABLE "ARLAD"



HENRY FILTERS AND FILTER-DRIERS

with new heavy duty
sintered discs

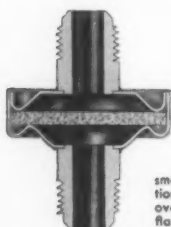
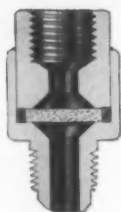


Actual photo-micrograph of
section of Henry sintered
disc (magnified 50 diam.)

... more efficient
... free flow of refrigerant
... will not collapse if clogged

TYPE SF 12

A small unit for domestic refrigerators, water coolers, etc. May be installed directly on expansion valve, etc. 1 1/2" long with 1/4" fem. x 1/4" male flare.



TYPE SF 21

A larger filter for small commercial installations. 2" diameter. 2 1/4" overall length. 1/4" male flare connections.



TYPE SFD 11

Combination Sintered Filter-Drier. Small efficient unit filled with silica gel. 1 1/4" diameter shell with 1/4" male flare connections.

**Other Filter-Driers With Sintered Discs Having
6 and 12 Cubic Inches Drier Capacity Also
Available. Ask For Special Bulletin.**

HENRY now offers small filters and filter-driers with sintered metal filtering elements. The sintered metals, in disc form, are made from metallic powders carefully screened for controlled particle size, fused under hydraulic pressure and controlled heat into a porous, homogeneous mass.

The Henry sintered discs will filter out particles larger than 75 microns (.003") diameter, roughly the filtering equivalent of a 200 mesh screen. While more effectively collecting foreign particles in a system, these discs possess an inherent porosity that assures free passage of the refrigerant. The most important advantage is the fact that Henry sintered discs will not collapse if they become clogged because they are designed to withstand 300 pounds pressure. Ask your Henry jobber for full information on the economies as well as the improved protection these new Henry filters and filter-driers afford.

Special designs can be furnished
for volume requirements.



HENRY VALVE COMPANY

Control Devices, Valves, Driers, Strainers and Accessories for Refrigeration and Air Conditioning and Industrial Applications

3260 W. GRAND AVENUE • CHICAGO 51, ILLINOIS Cable: HEVALCO CHICAGO

ANNOUNCING
The Merger of
EXTRUDED METALS, INC.
BELDING MICHIGAN

With
DETROIT GASKET & MFG. CO.
Effective Jan. 2, 1947

THE Detroit Gasket & Manufacturing Company now enters a new field and offers all industry a diversified production of fabricated products from extruded aluminum and brass alloys.

John L. Barrett, former President of Extruded Metals, Inc., is now Director and Vice-President of the Detroit Gasket & Manufacturing Company in charge of Extruded Metals Division. Russell A. Blanchard remains Manager of the Belding Plant.

R. H. Diehl

President

DETROIT GASKET & MANUFACTURING COMPANY

DETROIT 23, MICHIGAN



"...and it weighs so much less!"

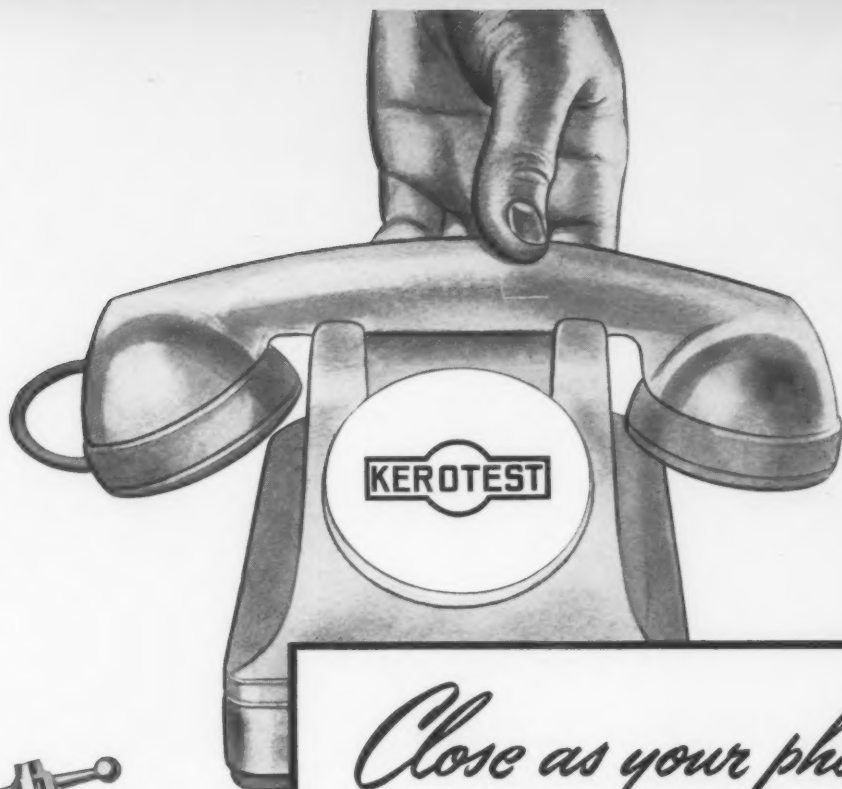
Important to the manufacturer of cabinet and other types of self-contained refrigeration units is the light weight of the new Mills Direct Drive Compressor. It makes possible lighter support structures, easier handling, and reduced transportation costs.

This saving in weight is possible partially through a reduction in size and the elimination of drive wheels and belts. Yet there has been no sacrifice in accessibility and ease of service and repair in the field. Through a number of remarkable engineering developments, the Mills Direct Drive Condensing Unit is more efficient than either hermetic or conventional belt-driven compressors.

MILLS *Direct Drive* **COMPRESSOR**

First post-war addition to a distinguished family of air- and water-cooled condensing units

MILLS INDUSTRIES, INCORPORATED • 4100 FULLERTON AVENUE • CHICAGO 39, ILLINOIS

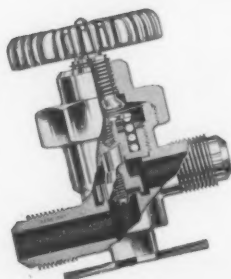
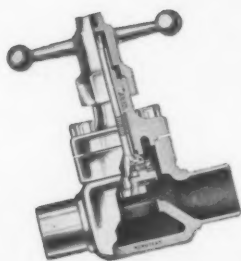


Close as your phone-

LESS INVENTORY REQUIRED!

RIGHT near you there's a man carrying a load for you—because it's *his* business. He's your Kerotest Wholesaler . . . whose ample stocks of Kerotest Quality Valves and Fittings are at your disposal so that you may have everything you need "on tap" . . . without the burdensome overhead of a private inventory.

Located everywhere . . . to serve all America . . . your Kerotest Wholesaler is as close as your 'phone. Look to him for time-saving, money-saving service regularly—for emergency service when needed—on Kerotest Quality Valves and Fittings for every Air Conditioning and Refrigeration need.



See your

KEROTEST

Wholesaler

KEROTEST MANUFACTURING CO.
PITTSBURGH, PA.

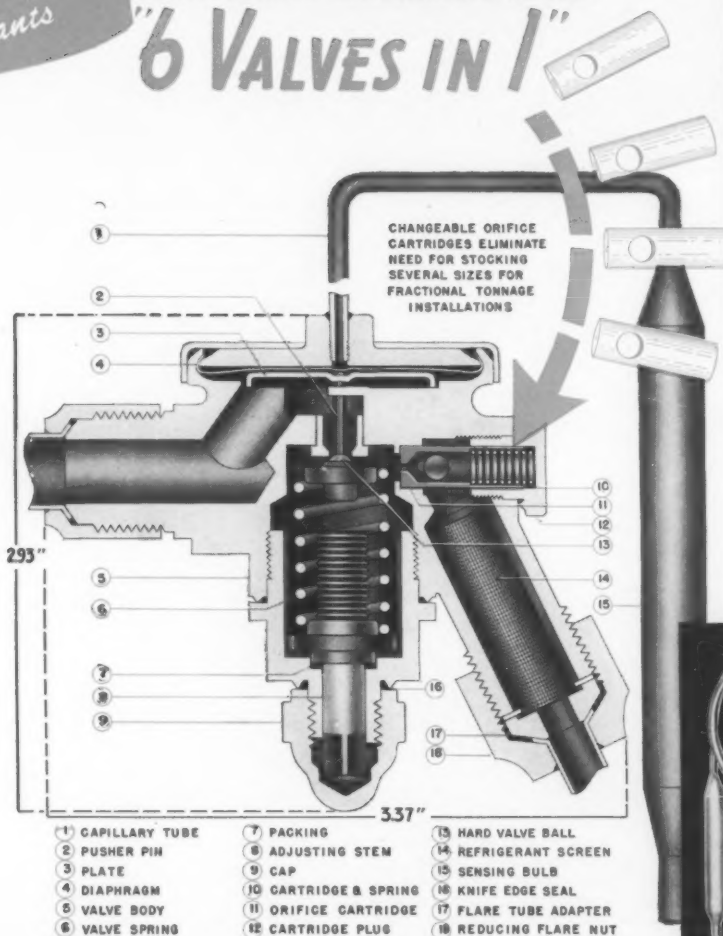
AMERICA'S FIRST NAME IN QUALITY VALVES

The
UNSURPASSED
CONTROL for
Refrigerants

V-200

THERMOSTATIC EXPANSION VALVE

"6 VALVES IN 1"



CHECK THESE FEATURES

V **THOROUGHLY FIELD-TESTED** for Freon, Methyl Chloride and Sulphur Dioxide.

V **EASILY-CHANGEABLE** orifice cartridges eliminate need for stocking several sizes for low tonnage installations.

V **AMPLE** diaphragm plus balanced, low-rate adjusting spring.

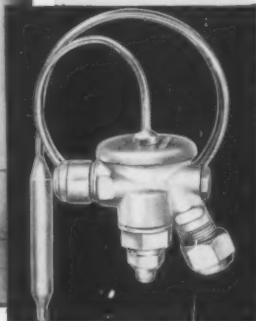
V **CAREFULLY-LAPPED** hard-faced ball insures tight shut-off.

V **FRICTIONLESS** pusher pin.

V **SEMI-LIQUID CHARGED**; may be placed in ambient temperatures higher or lower than bulb temperatures with no loss of control.

V **UNMATCHED** sensitivity.

For complete specifications on the V-200 and other refrigerant controls in the broad GENERAL CONTROLS line, write for Catalog 52C. . . Send request to the nearest GENERAL CONTROLS Factory Branch or Refrigeration Wholesaler.



THERMAL EXPANSION VALVE V-200-1 FOR FREON—METHYL CHLORIDE—SULPHUR DIOXIDE

CARTRIDGE NUMBER	CAPACITIES — V-200-1							
	FREON		METHYL CHL.		SULPHUR DI.			
	CAT. NO. 35R121		CAT. NO. 35R122		CAT. NO. 35R123			
	V-200-1F		V-200-1M		V-200-1S			
	BTU/HR.	TONS	BTU/HR.	TONS	BTU/HR.	TONS	BTU/HR.	TONS
6500-014	1200	.10	2400	.20	2400	.20		
6500-018	2400	.20	4800	.40	4800	.40		
6500-024	3600	.30	7200	.60	7200	.60		
6500-035	6000	.50	12000	1.00	12000	1.00		
6500-052	9000	.75	18000	1.50	18000	1.50		
BASE VALVE WITH NO CARTRIDGE	12000	1.00	24000	2.00	24000	2.00		

Valves are semi-liquid charged and may be placed in ambient temperatures either higher or lower than bulb temperatures in any position inside or outside of the freezer cabinet without danger of loss of control. The adequate diaphragm area in combination with the well balanced low rate adjusting spring, full opening tight closing ball, and practically frictionless single pusher pin form a valve unsurpassed in sensitivity and dependability.

NATIONALLY DISTRIBUTED BY REFRIGERATION WHOLESALERS

GENERAL CONTROLS
801 ALLEN AVENUE GLENDALE 1, CALIF.

FACTORY BRANCHES: ATLANTA • BOSTON • CHICAGO • KANSAS CITY • DALLAS • DENVER • DETROIT • PHILADELPHIA • NEW YORK
CLEVELAND • SAN FRANCISCO • HOUSTON • SEATTLE • PITTSBURGH • DISTRIBUTORS IN PRINCIPAL CITIES

17-1

COLD FACTS
you should KNOW about

COMMERCIAL **REFRIGERATION** **FINANCING**

Recent national developments encourage the prediction that 1947 will witness a tremendous increase in the production and sales of commercial refrigeration equipment.

To obtain his proper share of the increased volume, every distributor and dealer must be in a position to *finance* a large part of his sales and installations. At a conservative estimate 50% of sales will be on a time payment basis.

To meet every financing requirement the Commercial Refrigeration Industry has Approved Plans, administered through an organization thoroughly experienced in this specialized branch of sales financing.

The requirements as to amount of down payments and monthly payments at various maturities, have been soundly worked out and have been approved by the Commercial Refrigeration Manufacturers Association, representing 80% of U. S. production.

In all time sales made through these Industry Plans, the seller immediately receives the full sales price.

Every established manufacturer, distributor and dealer, not at present using or thoroughly informed about these Industry Plans is urged to investigate it now. Application forms and sales forms may be obtained from any of more than 300 Commercial Credit offices throughout the country.

COMMERCIAL CREDIT CORPORATION

You Can Stake Your *Reputation* on These Two

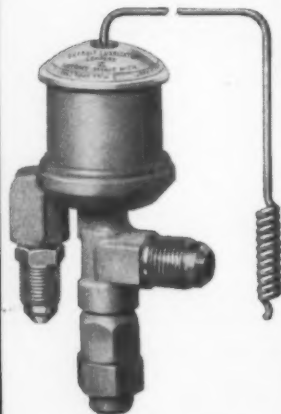
"DETROIT" No. 573 No. 673

THERMOSTATIC EXPANSION VALVES

You can place complete dependence upon these two valves. Stake your reputation on them—they never let you down. Try these valves on commercial installations from $\frac{1}{2}$ to 3 $\frac{1}{2}$ tons Freon-12.

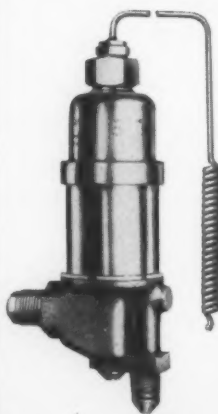
UNIT NUMBERS OF NO. 573 VALVE			
Stock Items with Your "Detroit" Wholesaler Use "Detroit" Unit Numbers When Ordering			
Unit No.	Refrigerant	Max. Pressure	Connection
57300	Freon-12	45	Inlet $\frac{3}{8}$ " SAE for $\frac{1}{2}$ " x $\frac{1}{2}$ " SAE for $\frac{1}{4}$ " x $\frac{1}{2}$ " reducing reducing out. Outlet $\frac{1}{4}$ " out
57309	Freon-12	10	
57311	Methyl	35	
57315	Methyl	8	
Rated at $\frac{1}{2}$ ton Freon-12 or .9 ton Methyl			

UNIT NUMBERS OF NO. 673 VALVE			
Stock Items with Your "Detroit" Wholesaler Use "Detroit" Unit Numbers When Ordering			
Unit No.	Refrigerant	Max. Pressure	Connection
6731968	Freon-12	15	Inlet $\frac{3}{8}$ " SAE for $\frac{1}{2}$ " x $\frac{1}{2}$ " reducing nut. Outlet $\frac{1}{4}$ " SAE
6731428	Freon-12	55	
6731563	Methyl	10	
6731411	Methyl	40	
Rated at 1 ton Freon-12 or 2 ton Methyl			



No. 573 ALL THE DEPEND- ABILITY OF THE 673 FOR SMALLER INSTALLATIONS

This valve, in $\frac{1}{2}$ ton (Freon 12) capacity, has the quality and operating characteristics of No. 673. Designed for small commercial installations, its double diaphragm gas charged power element permits close superheat control at low suction pressures and provides motor overload protection in its simplest, most effective form, using only one power element.



No. 673 FOR MANY YEARS "THE STANDARD OF THE REFRIGERATION INDUSTRY"

"Detroit" No. 673 has a long record of dependable performance in a wide variety of installations and has been, for many years, "the standard of the refrigeration industry". Designed for average size commercial and air-conditioning installations. Sensitive and accurate in operation—gas charged for instant response and reduction of motor load during pull-down cycle. Duraflex bellows and Delubaloy needles and seats resist corrosion and assure long life.

DETROIT LUBRICATOR COMPANY



General Offices: 5900 TRUMBULL AVENUE, DETROIT 8, MICHIGAN

DIVISION OF AMERICAN RADIATOR & STANDARD SAFETY CORPORATION

Canadian Representatives: RAILWAY AND ENGINEERING SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG

"Detroit" Heating and Refrigeration Controls • Engine Safety Controls • Safety Float Valves and Oil Burner Accessories • "Detroit" Expansion Valves and Refrigeration Accessories • Stationary and Locomotive Lubricators

4

EXTRA VALUES at no extra cost...

ANACONDA CUP SEAL* TUBES

- 1** Clean, Bright, Dehydrated Interior maintained by the cup seal.
- 2** Waste Minimized because end cut off is no longer than diameter of tube.
- 3** No Sharp Edges at the end of tube to dent or mar coil.
- 4** Easily Fed through smaller openings than is possible with crimped or flattened ends.



TYPICAL of the extra value engineered into *Anaconda* Refrigeration Tubes is this exclusive Cup Seal*. A small item, to be sure, yet it protects the interior of the tube, reduces waste, minimizes danger of damage to the coil, and facilitates installation.

Anaconda Refrigeration Tubes . . . made to A. S. T. M. specifications B68-43 . . . are 99.9%

*Patent Applied For



Anaconda Refrigeration Tubes

FRENCH SMALL TUBE BRANCH OF THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut • *Subsidiary of Anaconda Copper Mining Company*

In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ont.

pure copper, specially deoxidized to increase their corrosion resistance. As you'd expect, they are uniformly soft, easy to bend and can be readily flared without cracking.

Ask your jobber about Anaconda Copper Refrigeration Tubes. Available in standard sizes up to and including $\frac{3}{4}$ " O.D. in 50 foot coils. Other lengths on special order.

07411



F UNIT-750

AIR CONDITIONING UNITS

10 SIZES—FLOOR AND CEILING TYPES

Cooling • Heating • Dehumidifying • Humidifying

- 3 to 35 tons—900 to 13,000 CFM
- Any coil combination—Heating and cooling
- Optional: (1) Face and by-pass dampers (2) Insulated casing (3) Humidifying pans or sprays (4) Filter section (5) Eliminators and defrost sprays
- Industrial Refrigeration or Comfort Conditioning
- Noise Rated—Sectional Construction

Write for Bulletin 409

MARLO

HEAT TRANSFER SURFACE

Ball-Bonded Blast Coils—Cooling and Heating • Air Conditioning and Refrigeration Apparatus • Industrial Blower Units • Unit Coolers
Evaporative Condensers and Coolers • Low Temperature Apparatus
Cooling Towers

MARLO = HEAT TRANSFER
Since 1925

MARLO COIL COMPANY

ST. LOUIS 10, MISSOURI

NEVER BEFORE

*A MONEY MAKING
OPPORTUNITY
LIKE THIS!*



Another Quality Product
from the House of Hudson

Cash In On The Extraordinary Demand For The NEW 1947 HUDSON **CONSTANT PRESSURE** CARBONATOR

Here, at last, is a carbonator that eliminates the usual problems of making soda water at the point of sale. The HUDSON Carbonator is a complete, self-contained, *motorless* unit that delivers a steady flow of sparkling, carbonated water, —at **CONSTANT PRESSURE** up to 125 pounds at the draft arm, regardless of water pressure in the city water line. This unusually compact unit takes little more space than two-1 qt. beverage bottles. Measures only 16 $\frac{3}{4}$ " x 9 $\frac{3}{4}$ " x 3 $\frac{3}{4}$ " overall and weighs only 17 pounds. It is entirely automatic with two reciprocating cylinders that alternate in operation to provide a capacity of at least 25 gallons per hour. Will also operate Coca-Cola dispensers and root beer barrels. May be installed in any sweet water

bath or other conventional cooling system. Think of it! No more space consuming carbonator installations in damp basements, no more bulky soda coils, no more replacements of motors, pump packings, or pinion gears—no more oiling and greasing of moving parts.

HUDSON *Constant Pressure* Carbonators are the only carbonators that are guaranteed for 10 years!

NOTE: Deliveries of HUDSON *Constant Pressure* Carbonators are being made as rapidly as possible. Write, on your own letterhead, for further details. Please indicate the territory you now cover and the products you are handling. Nearly 10,000 HUDSON Carbonators are now in daily use.

HUDSON PRODUCTS CO. Inc.

2135 EAST CANFIELD AVE.
DETROIT 7, MICH.

EXPORT DIVISION • 2111 Woodward Avenue, Detroit 1, Michigan, Cable: FORACO

**AN
ADDITION
TO
OUR LINE**

**MUELLER BRASS CO.
SIDE OUTLET
DEHYDRATOR**



The Mueller Brass Co. Side Outlet Dehydrator permits the renewal of the drying agent without breaking the line. All that is necessary is to remove the flanged end, remove the exhausted drying agent, and replace with new.

All Mueller Brass Co. Filters and Driers are provided with the CONE SCREEN OUTLET, a specially designed filtering element that adds immeasurably to the life and efficiency of Driers and Filters.

Almost all crystalline dehydrating agents are subject to a certain amount of abrasion while a dehydrator is in service. Small portions of the dehydrating agent break down into very fine powder and crystals. Unless a well-designed filtering element is incorporated in a dehydrator, these fine

crystals and powder have a tendency to clog the outlet filter, resulting in restriction to the flow of refrigerant.

With the M.B.CO. CONE SCREEN OUTLET, such finer crystals and powder are forced to the base of the cone, leaving the center and tip of the screen open to the free flow of refrigerant.

In addition, the cone screen is filled with pure wool which traps such particles that are sufficiently fine to pass through the screen mesh.

Particular attention has been paid to screen areas in Mueller Brass Co. Filters and Dehydrators, so that each size permits efficient passage to the maximum refrigerant volume that is used in a particular size refrigerant line.

MUELLER BRASS CO.
PORT HURON, MICHIGAN



ear to the ground ...

... eye to the future



Keeping an ear to the ground has enabled Kold-Hold Engineers to fully satisfy changing refrigeration needs for over a decade in the transportation and storage of perishable items. With an eye to the future, Serpentine Plates have been developed to provide a more satisfactory, modern, low cost method of protecting perishable goods through complete processing between the farmer and consumer.

The construction of Serpentine Plates eliminates the necessity for internal tubing thereby decreasing their weight per square foot. It also insures complete refrigerant circulation through all tubes and prevents oil logging. The Serpentine Principle develops the highest rate of heat acceptance ever attained with natural convection lowsides.

Whether used as Plates, Banks of Plates or Fabricated into Stands or Liners, Serpentine Plates have unlimited possibilities in the development of newly designed units. In addition they are also ideal for the conversion of old cabinets, coolers or fountains.

In truck refrigeration streamlined "Hold-Over" Plates maintain the temperature of delivery truck bodies at the uniform level necessary in the successful transportation of fresh meat, ice cream and frozen foods.

Keeping an ear to the ground and an eye to the future through use of Serpentine Plate Type Evaporators will build greater profits for you through more satisfied customers . . . less spoilage . . . and lower operating costs. Write today for full information on these modern refrigeration methods.

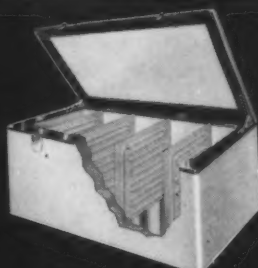
KOLD-HOLD

Jobbers in Principal Cities

KOLD-HOLD MANUFACTURING COMPANY

503 East Hazel Street

Lansing 4, Michigan

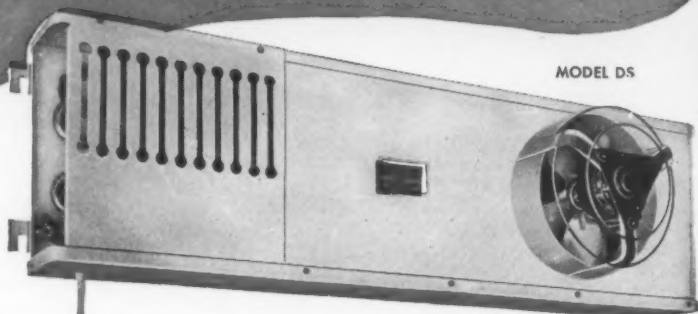


2 NEW AMCOILS!

SPACE SAVING! LOW COST!

Amcoil Double-Shot Cooling Unit

For reach-in,
walk-in and
display coolers



MODEL DS

Here's a *low-cost* cooling unit that gives maximum cooling using minimum space.

Amcoil's new double-shot principle passes the air thru the same coil twice — gives highest efficiency with low velocity cooling. The new shallow coil design permits higher humidities resulting in less dehydration.

The Amcoil Double Shot Line is ideal for low cost cooling in reach-in, display and walk-in boxes.

Let Amcoil prices convince you that this line is a natural for volume sales.

These new overhead models mean fast sales for you.

They answer your customers' long-felt need for efficient cooling at low cost.

These compact units go into any type of cooler with plenty of headroom — only 10¾" high. Installation is easy — operation is efficient. Temperatures down to 36°F.

AMCOIL Alservice Overhead Cooling Units are available in a wide variety of one- or two-directional models.

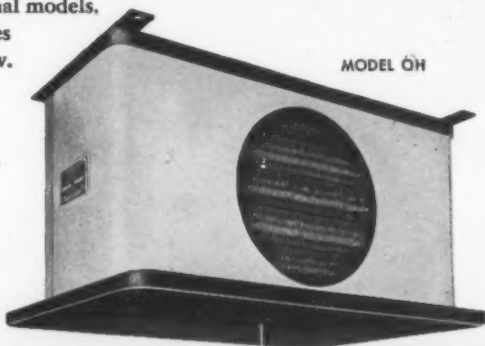
Ask AMCOIL for details and prices on these fast-selling units, now.

Amcoil Alservice Overhead Cooling Unit

For walk-in or reach-in coolers



Amcoil Extended
Surface Fin
Increases Capacities.
Pat. No. 2,402,262



MODEL OH

DEALERS, JOBBERS! AMCOIL'S National Advertising Helps You



Advertising in these National consumer publications helps make your selling job easier.

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Wm. C. McGuire, 691 Yorkshire Road, N.E., Atlanta, Ga. • J. York Feitel, 813 Howard Ave., New Orleans, La.
A. J. Nelson Co., 1635 Blake St., P.O. Box 2244, Denver, Colo. (CHerry 4131) • Russell Sales Co., 1421 So. Broadway, Los Angeles 15, Cal.
Russell Sales Co., 1533 N. 37 St., Seattle 3, Wash.



Deluxe Food
Conditioner —
Pat. Pend.



Display Case —
Food Conditioner
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Zero Breeze —
Low Temp. Unit
Pat. Pend.



Utility Downdraft



Alservice
Open Face



Two-Way Ceiling
Mounted



Reach-In
Panel Unit



Comfortaire
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AMCOIL



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NEW! GILMER #355 ASSORTMENT OF REFRIGERATOR V-BELTS

Makes right selection
QUICK, EASY, SURE
in SHOP or TRUCK



This carefully selected Gilmer V-Belt assortment provides the foundation of a complete V-Belt department. It contains all of the most frequently called-for sizes, each of which can be easily and quickly identified.

Assortment consists of 50 Gilmer V-Belts together with valuable servicing and merchandising aids. Included among them is the handy, compact, 8-hook Metal Wall Rack for hanging in service department or mounting inside service truck.

Gilmer V-Belts are noted for their accurate fit, firm grip, pulling power and long life. And they are made in all standard refrigerator sizes.

Order the new No. 355 Assortment from your Gilmer distributor today. Total cost, \$39.90. Belts sell for \$66.50. Dealer's net profit, \$26.60.

Your Gilmer distributor carries a complete stock of replacement belts.

L. H. GILMER COMPANY

Tacony, Philadelphia 35, Pa.

Division of United States Rubber Company

ASSORTMENT #355 CONSISTS OF

1. 50 assorted V-Belts
2. 8-hook Metal Wall Rack
3. Gilmer Handimeter (patented) for quick measuring of belts
4. Gilmer V-Belt Catalog, "America's Belt Bible"
5. Inventory Card
6. Attractive Window Display Card

EARNS YOU A
NET PROFIT of \$26.60

Sound From Every Angle!

CURTIS

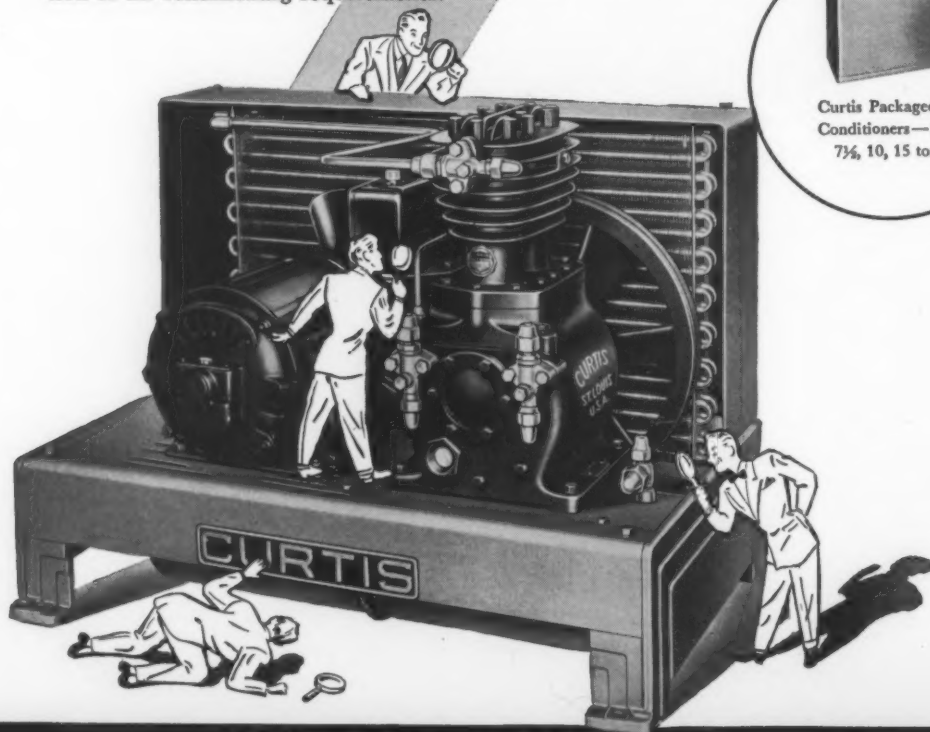
Refrigeration and Air Conditioning Equipment

The soundness of Curtis equipment is apparent in every detail of design, engineering, materials and construction. Its record of high efficiency and low operating and service expense has won friends with dealers and users everywhere.

Curtis features include:

1. Timken Bearings that assure lower power consumption.
2. Extra large condensers.
3. Self-oiling — positive lubrication.
4. Slow speeds — longer life.
5. Quiet operation.

You can sell *Curtis* with confidence — for almost any refrigeration or air conditioning requirements.



Curtis Packaged Air
Conditioners—3, 5,
7½, 10, 15 tons.

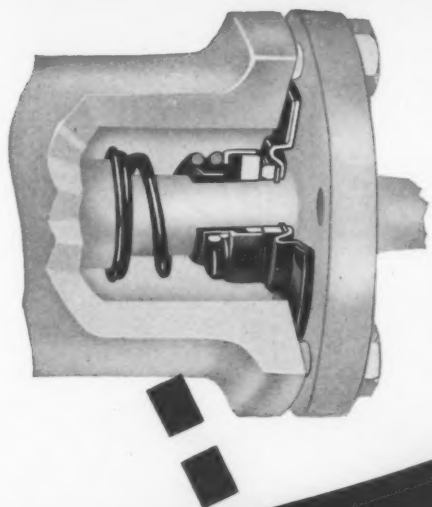
92 Years of Successful Manufacturing

CURTIS REFRIGERATING MACHINE DIVISION

of Curtis Manufacturing Company

1915 Kienlen Avenue

St. Louis 20, Missouri



Built on the Principle that—

"The Fewer Working Parts There
Are the Less Danger of Trouble"

"SEALING with CERTAINTY"
with **ROTARY SEAL**
REPLACEMENT UNITS

- Rotary Seals are backed by the most liberal guarantee on the market and available for over 752 models of refrigerator assemblies.



ROTARY SEAL COMPANY

2020 N. LARRABEE ST., CHICAGO 14, ILL.

Canadian Office: 382 Victoria Ave., Montreal 6, Canada

NEW

Control For Refrigeration Jobs . . .

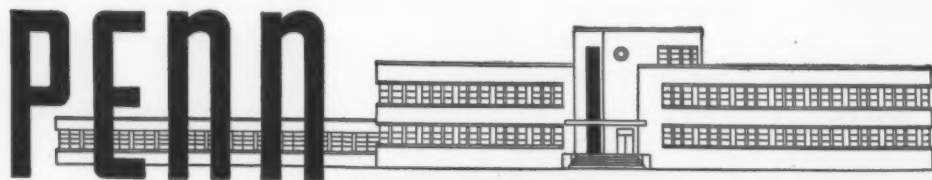
It's the PENN 270 Series! This new, different and better line of controls is *the first and only line* in the refrigeration and air conditioning fields to feature a load-carrying, 2-pole switch. In reality, this control provides *two switches in one . . .* yet this plus value of application versatility can be obtained *without paying a premium.*

Where protection against single phasing is provided, the PENN 270 can control polyphase motors without line starters. It can control two separate load circuits. It always breaks the "hot" line when wired in single phase circuits as a 2-pole switch.

Investigate this new 270 series. It means greater dependability, more efficient operation, freedom from contact trouble, better electrical performance, greater accuracy regardless of mounting position or vibration conditions, close differential, ease of installation and simple, easier adjustments. *Penn Electric Switch Co., Goshen, Ind.* Export Division: 13 E. 40th St., New York 16, U.S.A. In Canada: Penn Controls, Ltd., Toronto, Ont.



Series 270 and 272 PENN "Single" temperature or low side pressure controls. Also (not shown) Series 271 and 273 PENN "Dual" Controls which combine in one unit a temperature or low side pressure actuated mechanism and built-in high pressure safety cut-out.



AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

BTU

News • Laws • Trends

● **Freezers for Car Dealers.** A "home size" food freezer of 6 cu. ft. capacity will be the first of a number of "interim" products to be offered to dealers of the Bobbi Motor Car Corp. to tide them over the "low income" period prior to delivery of new cars, George D. Keller, president of the Birmingham, Ala., company, has announced. A table model radio is another projected item for the company's dealers, and a third product, still in the blueprint stage, is a household refrigerator. Manufacture and distribution of the "interim" products is being handled by the Haney Corp. of Philadelphia and Colorado Springs. Robert T. Haney, president of the Haney Corp., is also vice president in charge of sales for Bobbi Motor Car Corp. Dealers don't have to handle the "interim" products if they'd rather not do so.

● **Fit for a King.** King George VI of England and his family will tour the Union of South Africa in comfort, thanks to American air conditioning equipment. Carrier has shipped to its railway representative in London 13 Freon compressors to be used in cooling the coaches which members of the royal family and their party will occupy. The coaches, in addition to being air conditioned, also will be equipped with radio, telephones, private baths and "all the amenities of home life and stately occasions."

Also for the king's comfort, the Senate chamber of the Parliament Building in Cape Town, where he will address the opening session, is being air conditioned by Carrier.

● **Frozen Meals.** The complete line of pre-cooked frozen meals developed by Maxson Food Systems, Inc., has been placed on sale at Macy's in New York City. Each meal consists of an entree and two vegetables, and includes steaks, turkey, goulash, shrimp, lamb and other items—including frankfurters. Prices range from 74 cents, for the franks-and-kraut combination, to \$1.99, for the tenderloin steak dinner. It'll be interesting to see how sales develop.

● **Packaged Cooling Market.** According to a market analysis made for Pacific Mfg. Corp., Cleveland air conditioning manufacturer, annual sales of self-contained window and floor units will zoom from their prewar peak of 44,000 in 1941 to an estimated 238,000 per year as soon as the materials situation permits production in that quantity. Annual sales at present price levels, the survey indicated, will level off at about a quarter-million

units. Lower prices, however, will spread the market greatly. The 11-state area around the Mason-Dixon line, including District of Columbia, is seen as the best market, with the Texas, Louisiana and Kansas area as next best.

● **Vending Machine Market.** Refrigerated vending equipment will play an important part in the expansion which the vending machine industry anticipates in the next decade, Nathan Cummings, head of the Consolidate Grocers Corp., indicated in predicting that vending machines, within the next 10 years, will do a business of \$3 billion a year. "Perhaps in years to come there will be machines selling complete lines of frozen foods," Mr. Cummings said. "It is possible to foresee completely automatic grocery super markets."

● **Trade-Ins.** The trade-in problem hasn't been too tough during the war years, but with full-scale production of household units not too far off it might build up into a pretty fair-sized problem within a short time. At the recent annual forum of the American Fair Trade Council three methods were suggested for handling major appliance trade-ins: (1) the "blue book" method; (2) setting up a manufacturer's center where consumers can get a certificate of value on the old equipment, which they'd then take to the dealer for credit; (3) inserting a clause in the dealer's fair trade contract forbidding him from allowing more than the current trade-in allowance on the product.

● **The "Freon" Picture.** At this writing, things are somewhat brighter along the "Freon" front. The strike of one of Kinetic Chemicals' principal carbon-tet suppliers has been settled, so that the immediate threat of a cut-down in production from that cause has been removed. Also, back-ordered cylinders are coming in at a better rate, giving rise to the hope that this particular bottleneck may be eased before too long.

The carbon-tet strike, however, slowed down "Freon" output for at least 30 days, and there are still far too few new cylinders to be had. REMA, through its public relations office, has launched a publicity campaign to speed return of empties to Kinetic and other refrigerant producers. In releases sent to publications reaching the hotel, restaurant, food market, department and retail store, confectionery and ice cream store fields, emphasis is placed on the importance of returning empty cylinders promptly. Releases to railroad and trucking publications have stressed need of cooperation by these industries in helping to alleviate the cylinder situation.

● **Air Conditioning Outlook.** Sales of the air conditioning industry in 1947 should be three to four times the prewar volume, Carrier Corp. president Cloud Wampler declared in his year-end statement, in which he reported orders of \$40 million and shipments of \$23 million for 1946. Big industrial buyers, Mr. Wampler said, will be precision manufacturers and firms who make textiles, pharmaceuticals, chemicals, foods, and similar products. Commercial establishments such as restaurants, department stores, theaters, and food markets also represent a vast potential market, in his opinion. Carrier's foreign demand, he revealed, increased 183% over 1945.

at income tax time

Do You Take

Uncle Sam isn't looking for "sucker money," and you're not welching on your obligations as a solid citizen if you claim all the exemptions to which you are legally entitled when you file your income tax. This article tells you how to do right by yourself.

By Harold J. Ashe

Tax Counselor

IF YOU had \$500 in the bank you wouldn't pay \$100 or more income tax on that amount. You would pay only on such income as you derived from the deposit.

Despite this obvious fact, an exceedingly large number of refrigeration men do just that every year in a left-handed manner. They pay an income tax on apparent profits which, actually, are depreciating assets. And, they continue to pay income taxes on other unrecorded or hidden business expenses which, in the last minute scramble to meet the March 15 tax deadline, are overlooked.

While no one that I know yet has considered an income tax *per se* a virtue—though conceding its necessity—the income tax law may accomplish one good thing: It may make small business men more alert to the true earnings of their business by giving them a monetary incentive for more carefully recording ALL business expenses.

For generations, one of the minor tragedies of American business has been the illusion held by businessmen that they make more money—what an employee calls take-home pay—than in fact they ever do. Simple books may indicate a \$4,000 income with a drawing account of \$3,000, apparently leaving an annual nest-

egg of \$1,000; yet years later, even though this nest-egg presumably accrues each year, one day the business man wakes up to the sad fact that this "gain" represents substantially the difference between reality and illusion. While it worked out beautifully on paper, each year end it has disappeared. Where has it gone?

Usually, the answer is to be found in the constant drain upon the small business of hidden business expenses that do not appear in simple book-keeping set-ups. Unless recognized and properly recorded as business expenses, these are the items that every day of the year pilfer the cash drawer as surely as a defaulting employee.

In recent years this has been more forcefully brought home to me by the preparation of income tax returns for many business men, most of whom are counted reasonably astute in business matters. In filling out 1945 income tax returns, I estimated from my own experience that fully 50% of all small business men fail to report ALL of the costs of doing business.

To illustrate how this works, take a typical case. A business man has \$3,000 worth of equipment calling for a depreciation rate of 10% annually; that is, it has a life expectancy

of 10 years. He takes no depreciation. Yet, if this taxpayer is even in the lowest surtax bracket exclusively, this oversight costs him an additional tax of \$60 because his net profit—by his calculation—is \$300 greater by his failure to take \$300 depreciation to which he is rightfully entitled.

It has been my observation that the commonest oversights are failure to take: 1. Depreciation on some or all of the taxpayer's equipment or fixtures; 2. depreciation on delivery trucks; 3. depreciation on private cars used partly in business. I shall enumerate more in a moment.

The items already referred to represent business assets being liquidated through use in producing gross income without which no gross income or net income would be possible. The cost, through depreciation, of these items is as much a cost of producing income as are labor, merchandise, supplies and the thousand and one petty items usually so carefully recorded.

Probably the simplest explanation as to why the above items seldom appear as business expenses is because they do not appear in the books as expenditures in the year for which the report is being made, having been acquired in previous years—in some

WHAT IT COSTS

What Every \$100 of Unreported Business Expense Costs the Taxpayer in Additional Income Tax, based on 1946 rates.

If taxpayer's surtax income is:	Additional Income Tax Per \$100 Unreported Expense
Up to \$2,000	\$20
Over \$2,000, but not over \$4,000	22
Over \$4,000, but not over \$6,000	26
Over \$6,000, but not over \$8,000	30
Over \$8,000, but not over \$10,000	34
Over \$10,000, but not over \$12,000	38

Note: Above includes allowance for 3% normal tax, as well as surtax.

What's Coming To You?

instances long before the refrigeration man was required to pay an income tax. Actually, if a delivery truck was purchased say in 1942 for \$800 and has a life expectancy of five years, then it follows that this truck (in initial outlay alone) is costing the taxpayer \$160 annually as surely as though an item for that amount showed as an outlay for the tax year reported.

Again, some refrigeration men operate their businesses in conjunction with their homes. A dual purpose property (home and business) serves to confuse them as to which is business and which is residence. Because they are domiciled in such a property, they are inclined to think of such an establishment as a purely personal arrangement. Until advent of high taxes there was no pressing need for segregating business expenses from those of home. Moreover, many such taxpayers have long since arrived at the pleasant conclusion that, because the entire premises represent an outlay equivalent to that for a home alone, they, in effect, are getting free rent for the business. Now such thinking becomes more than a harmless bookkeeping deception. Such a belief fosters higher income taxes. The Treasury Department has long recognized that part of such an establishment is a business expense and may be so considered in making an income tax return.

If the property is rented, the business may be charged with a *pro rata* share of the rent, utilities and other divisible expense. This may be as little as 25% or even less, or as much as 75% or more, depending upon the division of improvements between home and business.

Likewise, where the taxpayer owns the property and uses it in large part for business purposes, he frequently fails to charge the business with any of the expense. Here are just a few of the items that he is undertaking to bear, himself, instead of entering

HOW MUCH DEPRECIATION?

The Bureau of Internal Revenue has determined that various depreciable items have certain years of useful life for purposes of determining rates of depreciation. In individual cases, these may vary, and the taxpayer may be allowed a more rapid rate of depreciation, or be restricted to a less rapid rate, depending upon the facts of each case. Generally, it may be accepted that equipment and other items, including buildings, may be depreciated in a shorter period of years, where the taxpayer has acquired them second-hand and where previous use by other owners has lessened their useful life. Such facts should be noted in setting-up depreciation schedules.

Typical rates of depreciation allowable per year are as follows, expressed in percentage of value at time of acquisition:

Display Cases	5%
Desks	5%
Linoleum	12½%
Carpets	10%
Safes	2%
Typewriter	20%
Awnings	20%
Automobiles	20%
Trucks, Light	25%
Brick & steel buildings	1 to 2%
Frame buildings	4 to 10%

them as a business expense to determine his true net income:

1. annual maintenance cost; 2. depreciation of property; 3. utilities; 4. insurance on property. Interest on mortgage and real estate is deductible fully as a personal item in any event, and need not be divided for tax purposes, though division is still desirable for his own information.

Moreover, as a sole owner, the taxpayer is apt to bear the cost of business entertainment out of his personal pocket on the unsound theory that whether it is charged to the business or not does not materially affect him. Even taxpayers having modest incomes not infrequently may spend several hundred dollars a year in small sums at a time treating their more favored customers. This may involve lunches, liquid refreshments, cigars and any other outlay of a similar nature. It is recognized by

the Treasury Department as a deductible item of business expense.

To illustrate the importance of a careful scrutiny of these expenses as they bear upon the real cost of doing business and as they may sharply decrease income taxes, let us take the case of a typical taxpayer.

Let us assume that he owns his own dual-purpose property which, exclusive of land value which cannot be depreciated, was worth at time of acquisition \$7,500. This is a two-story, typical small-town or suburban dual-purpose property: storeroom downstairs and living quarters upstairs with garage on rear of the premises. A fair division might be that 2/3 of the improvements are used for business and 1/3 is personal.

This taxpayer has a delivery truck acquired in 1942 for \$750; a passenger car purchased the same year

Continued on page 50

THE

WHEN

WHERE

WHY

HOW

OF THERMOSTATIC

By George H. Clark

THERMOSTATIC expansion valves are more widely used pressure reducing devices in commercial work than any other device. They work out very satisfactorily for multiple work where two or more evaporators are connected in parallel and are usually used with continuous tube evaporators where the quantity of liquid required is a minimum per evaporator. In themselves, and in connection with other automatic controls and valves, they permit various temperatures to be maintained by one condensing unit.

Due to the combined action of the thermostatic valve and the continuous tube evaporator which may show an appreciable pressure drop between inlet and outlet, many problems arise, and many problems are solved by variations in the design or hookup of thermostatic valves.

Among the problems peculiar to thermostatic expansion valves are those of surging, distribution of refrigerant to parallel circuit coils, paralysis of the power element, and the proper valve adjustment for different applications, and the selection of the right valve for the job.

Among the variations in valve manufacture may be listed the external equalizer connections, the use of limited fill gas charges, and other variations which will be discussed.

The use of thermostatic expansion valves within the writer's knowledge dates back to 1922 or 1923; how-

ever, their use did not begin to become general until about 1928 or 1929. The first thermostatic expansion valves in wide usage were made up of automatic expansion valves and power elements. The adjusting screw and spring of the automatic expansion valve was removed and a push rod and charged bellows was substituted for the spring. The pressure in the bellows responded to the tem-

perature of a bulb attached to the bellows by a small diameter tube.

Figure 1 shows the essential elements of an automatic expansion valve, in which A is the high pressure liquid inlet, B is the valve orifice, C is the needle, on the shaft of which is collar D. Spring E tends to close the valve and should be stiff enough to hold the needle closed when spring F and bellows G exert no force on push rods H. I is the outlet to the evaporator and J is the adjusting screw. Since the area of the valve orifice is very small, a change in inlet liquid pressure has little effect on the operation of the valve. For

Fig. 1 (right)—Essential elements of an automatic expansion valve.

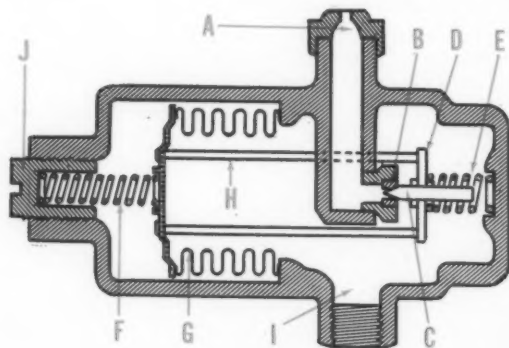
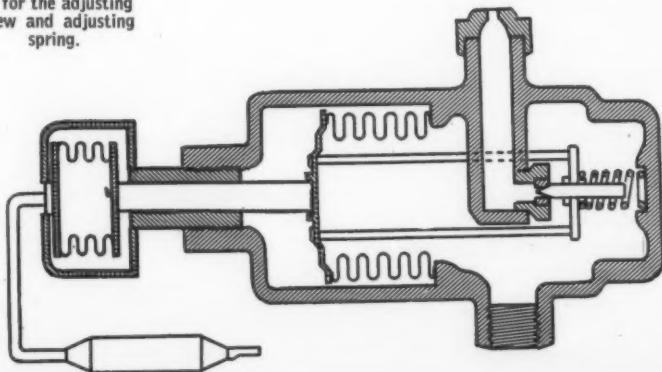


Fig. 2 (below)—The automatic expansion valve transformed into a thermostatic expansion valve by substituting a power element and push rod for the adjusting screw and adjusting spring.



EXPANSION VALVES

PART 1

Presenting some basic facts to help you in your installation and servicing work with these metering devices

instance, the area of an .032 orifice is about .0008 sq. in. and a change in inlet pressure of 100 PSI would only cause a force change on the needle of .08 lbs.

On the other hand, the effective area of the bellows may be 1.0 sq. in. so that a change of pressure in the valve body of 1 PSI would cause a change of force on the needle of 1 lb. or a pressure change in the valve body of .08 PSI would counterbalance a pressure change of 100 PSI in the inlet liquid pressure.

Eliminating inlet pressure variations then, the valve opens as the forces acting to the right become greater than those acting to the left. Thus when the spring F, plus the spring to the right of bellows G, plus the atmospheric pressure times the effective area of bellows G are greater than spring force E and the pressure in the valve body times the effective area of bellows G, the valve needle

will open and admit refrigerant into the valve body and evaporator until the pressure rise in the valve body times the effective bellows area is sufficient to close the needle. Thus with an automatic expansion valve, the only forces subject to change with any one adjustment are those due to changes in atmospheric pressure and an equal change in valve body pressure to compensate.

The change in evaporating temperature for any one setting may thus vary up to about 3° F. for changes experienced in atmospheric pressure in one locality. For high altitudes the change in evaporating temperature due to change in atmospheric pressure would be considerable, or as much as 10° depending upon the refrigerant and evaporating tempera-

ture. In the use of thermostatic expansion valves, however, the evaporating temperature may vary any amount according to the temperature of the control bulb.

Figure 2 shows the automatic expansion valve of Figure 1 transformed into a thermostatic expansion valve by substituting a power element and push rod for the adjusting screw and adjusting spring.

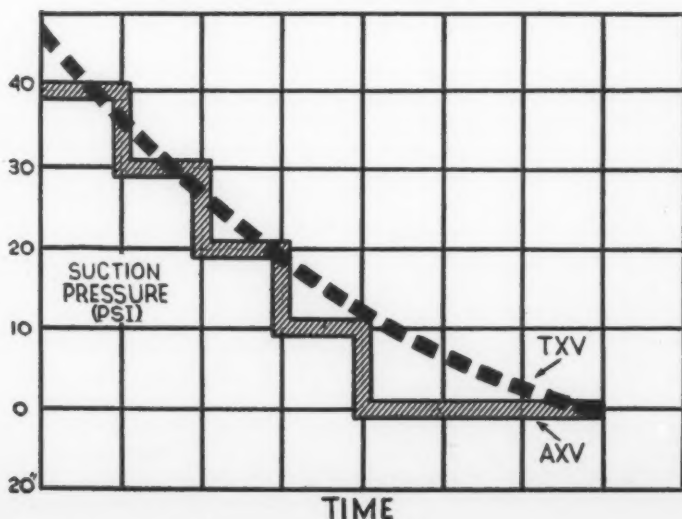
For any one temperature of the thermostatic bulb, the pressure in the power element bellows remains constant and the valve acts exactly as an automatic expansion valve. Instead of changing the adjustment of the valve by an adjusting screw, the setting is now changed by changing the temperature of the bulb.

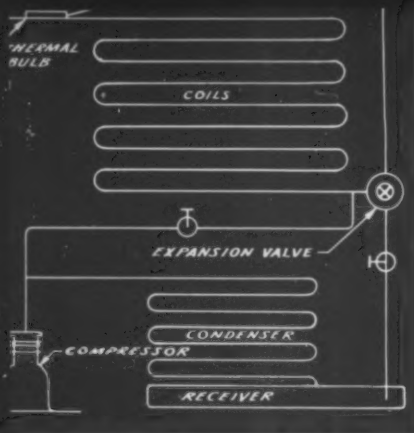
If an automatic expansion valve was to be used on a brine tank evaporator and the mechanic wanted to lower the temperature in the shortest possible time, he might make an original setting of the valve that is quite high. For Freon-12 he might set the valve to regulate at 40 PSI when the brine started at a high temperature. Probably by the time the brine was down to a temperature of 5 or 10° F. above the evaporating refrigerant temperature, the refrigerant would start to flood back in the suction line. When this happens, part of the compressor capacity is being used to chill the suction line and thereby serves no useful purpose. Consequently, the mechanic might readjust the valve to regulate at 30 PSI.

At the new temperature in the evaporating refrigerant, more heat can be taken from the brine without

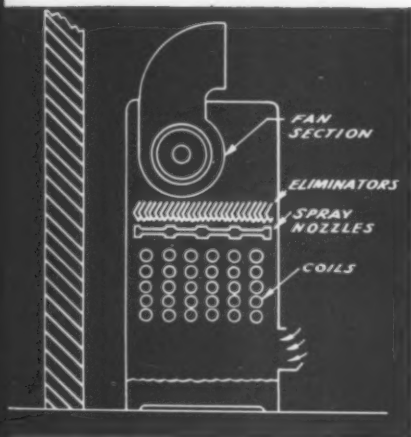
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Fig. 3—Curve of suction and discharge pressures.

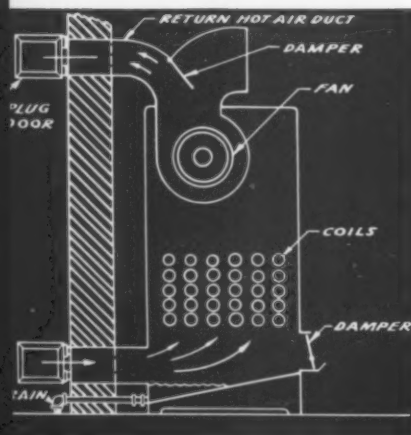




Hot gas defrost system—hot discharge gas is diverted from condenser to low side coil which acts as condenser and accomplishes defrosting in this manner.



Brine spray defrost system—series of spray nozzles above coil, sump in base, with circulating pump. Salt solution is pumped over coils to remove frost.



What Do You Know About DEFROST SYSTEMS?

By Warren W. Farr
Refrigeration Maintenance Corp.
Cleveland, Ohio

THE first thing that should be emphasized in considering the characteristics of the various types of defrost systems now in general use is that no one system is the answer for all types of jobs. Each type of system operates to best advantage under certain given conditions; each should, therefore, be applied where it fits best.

Generally speaking, there are three considerations which will determine the type of defrost system to select:

1. It should give the results desired under the conditions that must be satisfied.
2. It should be economical to operate in comparison to over-all cost of the complete installation.
3. Its maintenance cost should be low.

Our present consideration will deal with defrost systems for rooms operating at temperatures below freezing in a range of plus 32 F to minus 20 F.

We are all familiar with the fact that frost presents a serious penalty to any low temperature refrigerating system. It increases the temperature difference between refrigerant and air, creating a lower suction temperature at the machine, thus reducing machine capacity.

In designing a low temperature refrigerating system, we must use as close a temperature difference as possible and prepare to remove frost formation on the coils before the reduced heat transfer rate upsets

design conditions. In selecting the defrost system, care must be exercised not to select equipment where the initial cost or combined operating and maintenance cost will be so high as to offset the reduced operating cost secured by frost-free operation. The size of the total installation will dictate, to a certain extent, what expenditure can be justified on the defrost system. In extremely large installations rather high expenditures for refoast equipment are justifiable.

In laying out a low temperature room, provisions should be made to reduce the moisture content of warm air before permitting it to enter the low temperature area. One of the most economical ways to accomplish this is to provide an ante-room, refrigerated by a unit cooler to a temperature of approximately 36 F. This unit cooler should be large enough so that it can be operated on a defrosting cycle. This will remove a percentage of the moisture to the drain that would normally enter the freezer space. Wherever possible, canvas curtains should be provided on the inside opening of the freezer door frame to prevent unrestricted circulation of the low temperature air when the door is opened. These canvas curtains still permit easy access to the freezer space.

HOT GAS DEFROST SYSTEMS have been used for years. Many of these systems have performed very satisfactorily. The hot discharge gas is diverted from the condenser to the low side coil on the low pressure side of the expansion valve, and as the coil acts as a condenser, absorbing heat from the hot gas, the temperature is raised above the freezing point

Warm air defrost system—cooling unit is adjacent to outside wall, and fan circulates the outside air or air within refrigerated area to keep coils clean.

Here's a practical appraisal of the principal types of defrost devices now in general use, as seen through the eyes of a refrigeration contractor who's worked with all of them. You may not agree — but you'll be interested in the things he has to say

of water and the refrigerant is condensed. Extreme care must be exercised in providing a surge drum or accumulator of adequate capacity to collect any liquid refrigerant returning in the suction line to the compressor. In some cases it is necessary to provide either steam or electrical heat in a surge drum in order to vaporize the liquid refrigerant at a rapid rate to provide suction temperatures high enough to accomplish defrosting.

This system had a distinct advantage over scraping off frost by hand in freezer rooms where iron pipe coils were used. In most cases it was operated as a manual system, and the operator had to be on the lookout for liquid slugs which might damage the compressor. The defrost water was caught either in pans placed under the coils or in canvas drops suspended under the coils. If the water were permitted to drop on the freezer floor, it was almost as difficult to remove from the room as it would have been to scrape it from the coils originally. There were many adaptations of the Hot Gas Defrost System using solenoid valves and time clocks in place of hand valves, but it had limited possibilities as an automatic system, and the labor involved in removing the ice from the room after defrosting was not desirable.

BRINE SPRAY DEFROST SYSTEMS also were used early in the game. These devices consisted of an air unit in which there were mounted a series of spray nozzles above the refrigerating coil and a sump in the base, with a circulating pump connecting the two. A salt solution was pumped over the coils, keeping coils frost free at all times provided that the salt solution was maintained at the strength necessary to prevent freezing as it passed over the coil. The unit was provided with an over-

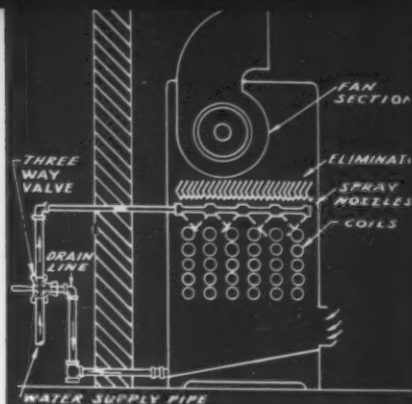
flow to the drain so that as the solution became diluted with moisture from the air and the liquid level in the sump was raised, the excess liquid would be removed from the system. As the dilution increased, the operator would add sufficient salt to maintain the brine at the proper specific gravity. In some instances, salt bins were provided with the equipment, and the solution was consistently strengthened as dilution occurred.

The efficiency of this type of system was high, as no frost was permitted to form on the coil, and close fin spacing was permissible. It provided an easy means of removing moisture from the freezer area. However, the cost of this system prohibited its use on small installations. Among its disadvantages was the fact that it used sodium chloride or calcium chloride brine, which had a very corrosive action upon any materials it contacted. Unless these brine solutions were carefully inhibited to prevent corrosion, the life of the system was short and maintenance costs were relatively high.

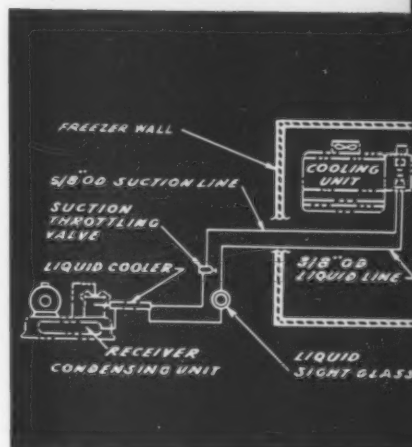
WARM AIR DEFROST SYSTEMS consist of an arrangement where a cooling unit is placed adjacent to an outside cooler wall. The supply and discharge air are arranged so that the fan can circulate air within the refrigerated area; or, when these openings are dampered off and plug doors opened to outside air, room air can be drawn through the coil.

This method has not received wide acceptance because in the summertime considerable quantities of moisture might be drawn into the unit

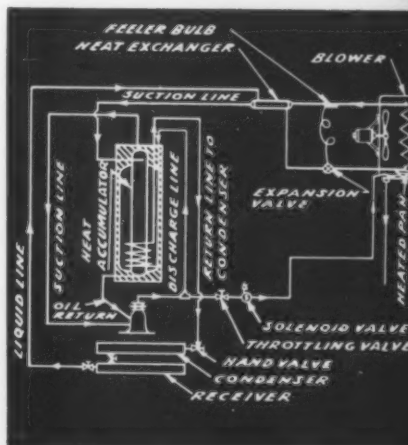
Automatic hot gas defrost system with heat accumulator—this system is used widely on both large and small jobs, stores up heat to speed defrosting.

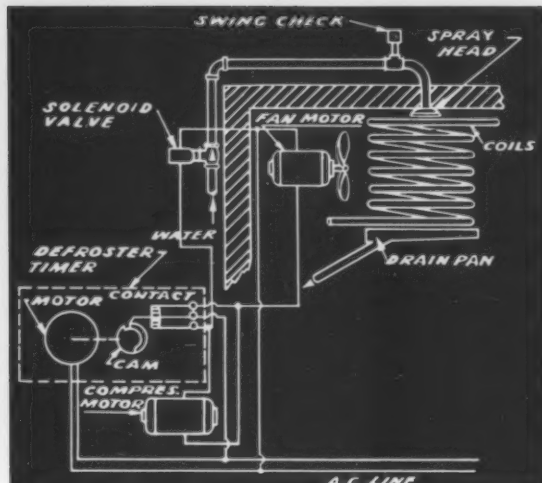
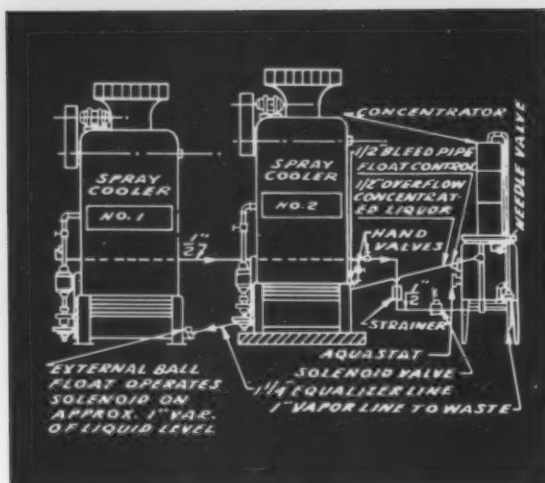


Manual water defrost system—series of spray nozzles above coil connected to cold water supply, with three-way valve in water line for regulating defrosting.



Electric defrost system—this type uses electrical immersion heater in contact with liquid refrigerant. Hot liquid is fed through coil in defrosting cycle.





with the outside air, and deposited on the coils before melting could occur. On occasion, too much moisture might be drawn into the unit to permit air circulation through the fins. When this occurred the defrosting cycle would be lengthened considerably, and the freezer temperature would rise sharply. During the winter months it was difficult to supply a sufficient quantity of warm air to accomplish defrosting. Unless these air units were heavily insulated the freezer temperature could not be held during a defrost cycle. Drains from this system are also difficult to keep free from ice, sometimes requiring running water during the defrost cycle to supply heat.

MANUAL WATER DEFROST SYSTEMS have proved very satisfactory when applied to low temperature coolers, and provide one of the least expensive gadget-free types of defrost systems. The system consists of a series of spray nozzles mounted above cooling coils, connected to normal cold water supply. Where abnormally low temperature water is encountered, it is sometimes necessary to use a mixing valve and supply a mixture of hot and cold water to provide defrosting within a reasonably short time. A three-way valve is provided on the supply water lines, which permits water to flow to the spray nozzles in the "ON" position and permits the nozzles and supply pipe above the valve to drain to the sewer in the "OFF" position, preventing freezing in this area, when

ABOVE, LEFT—

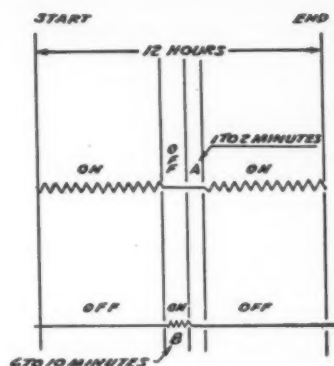
Automatic brine spray system with brine concentrator—sprays non-corrosive brine over coils, and concentrator "still" is used to keep brine at proper strength.

ABOVE, RIGHT—

Automatic water defrost system—same basic equipment used as for manual water defrost system, except that magnetic valve is used instead of hand valve.

RIGHT—

Time-cycle chart for 12-hour operation of automatic water defrost system. Note interval (B) to allow drainage before system is started after defrosting.



the system is returned to operation. All that it is necessary to do in operating this system is to shut off the fan circulation and allow water to flow over the coils until they are completely defrosted, permit the system to drain for a few minutes after the water has been turned off, and then return it to normal operation. This system of defrosting can be applied equally well to both large and small installations. It is desirable to insulate both supply and drain piping located in the cooler area, and to see that piping is pitched from the unit to the outside of the cooler so that rapid drainage from the cooler is accomplished.

One of the disadvantages of this system is that it requires constant inspection on the part of the operator to determine when defrosting is required.

This system operates at its highest efficiency for only a short time after defrosting, and the fin spacing of the

coil must be wide enough to permit air passage even though considerable frost is present.

It is the writer's personal choice where a low cost system must be selected.

ELECTRIC DEFROST SYSTEMS have been designed incorporating many different arrangements, both manual and automatic in operation. Electrical heating elements can be placed in the fin surfaces in much the same manner as the refrigerant tube. Another arrangement provides strip heaters placed around the inside of the insulated fan housing. Still another electrical defrost coil provides infra-red heat lamps focused on the coil surface. These systems usually incorporate a maximum temperature thermostat within the fan housing to prevent over-heating. These elements may be controlled by a manual switch or an electrical time

Continued on page 62

COOLING

for Human Comfort

PART 5

Determination of Supply Air Conditions

By S. C. Moncher
Regional Manager
Electric Power Equipment Co.

THIS series of articles on the fundamentals of comfort cooling is designed to serve two purposes: (1) provide those just entering the air conditioning field with a basic understanding of the factors involved in comfort cooling; and (2) enable the trained air conditioning engineer to discuss comfort cooling applications in a non-technical language that the prospect or the customer can understand.

MAINTENANCE OF ROOM DESIGN TEMPERATURES: In order to maintain the atmosphere of an enclosure at a predetermined climatic condition, it is necessary to introduce air into this enclosure at specific conditions of (1) volume, (2) dry-bulb temperature, and (3) wet-bulb temperature. To be sure, there are many different combinations of these three factors which will satisfy the requirements for any given room. Due to their inter-relationship, however, once any one of these three values has been determined, the other two are automatically fixed. It is not possible, therefore, to select arbitrarily more than one condition for the air supply. If room design dry- and wet-bulb temperatures are to be assured, the other two conditions of the supply air must be determined according to a definite mathematical procedure.

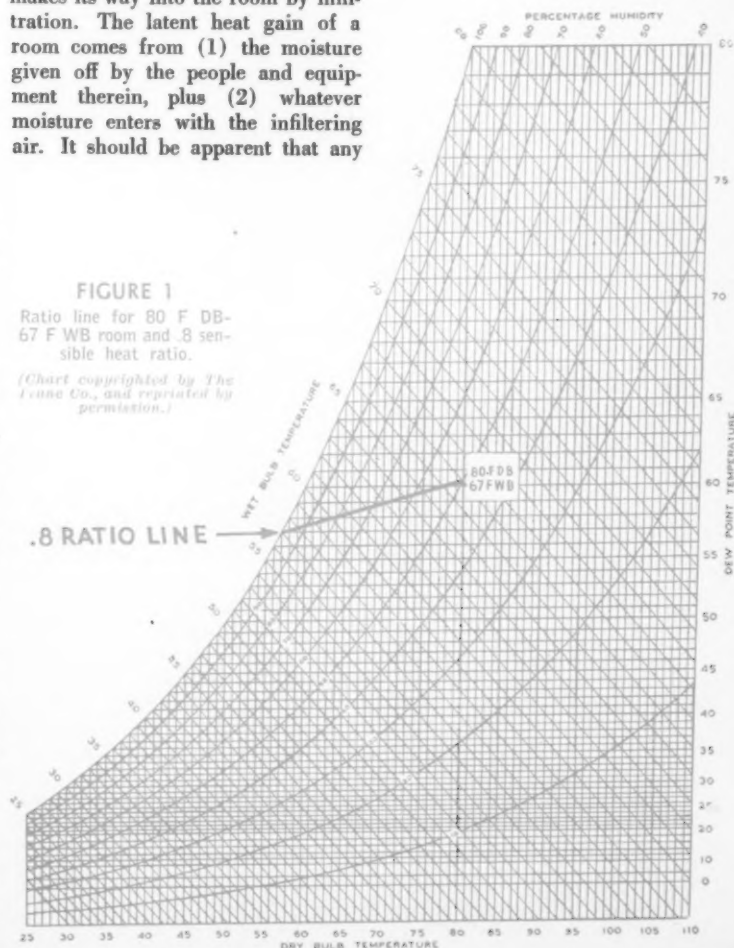
In comfort cooling installations, we are faced with the problem of maintaining simultaneously predetermined dry- and wet-bulb temperatures in a given enclosure. This is

accomplished by introducing cooled and dehumidified air at such a rate, that it just offsets the heat and moisture gain of the enclosure. We have previously noted that the sensible heat gain of a room consists of (1) conduction and solar gains, (2) the sensible heat load due to people and equipment, and (3) the sensible heat entering with any outdoor air which makes its way into the room by infiltration. The latent heat gain of a room comes from (1) the moisture given off by the people and equipment therein, plus (2) whatever moisture enters with the infiltrating air. It should be apparent that any

outdoor air brought directly to the cooling unit has its heat and moisture removed before reaching the room. Although this outdoor air ducted directly to the cooling unit imposes a load on the refrigeration equipment as it is cooled and dehumidified, it does not form a part of the load which the conditioned air delivered to the room must offset. Therefore, it is not taken into consideration when determining supply air conditions.

FEASIBLE SUPPLY AIR CONDITIONS: We have explained in the preceding section that in order to maintain desired conditions of temperature and humidity in a room, air must be supplied to this room at certain definite conditions of (1) volume, (2) dry-bulb temperature, and (3) wet-bulb temperature.

Naturally, the dry-bulb temperature of the supply air must be lower



than the dry-bulb temperature in the room, and the moisture content of the supply air must be less than the moisture content of the room air. The volume of the supply air must be exactly at the level where, as the heat and moisture gained by the room is absorbed by the supply air, its dry-bulb temperature and moisture content rise to that of the room air.

That it is not always feasible to select arbitrarily any of the three values defining the condition of the supply air, may be illustrated by the following example. Let us assume that a room with a sensible heat load of 80,000 Btu per hour and a latent heat load of 20,000 Btu per hour is to be maintained at 80 F DB -67 F WB. Now, suppose we arbitrarily select a temperature of 55 F for the dry-bulb temperature of the air supply. The volume of 55 F DB air necessary to remove 80,000 Btu of sensible heat per hour may be calculated by Formula 4, which we derived in Part III. A more convenient form of this formula as follows:

FORMULA 5

$$CFM = \frac{Btu_s}{td \times 1.08} \text{ where,}$$

Btu_s = room sensible heat gain, Btu per hour
 td = difference in dry bulb temperatures between room air and supply air, degrees F

Substituting in this formula, we have

$$CFM = \frac{80,000}{25 \times 1.08} = 2960$$

Therefore, 2960 cfm of 55 F DB air are necessary in order to offset the sensible heat gain of the room. Naturally, this same quantity of air will also have to absorb the moisture gained by the room. Let us, therefore, calculate the wet-bulb temperature this supply air will have to have in order to offset the latent heat gain.

The wet-bulb temperature of the supply air may be determined by Formula 3, derived and discussed in Parts II and III. A more convenient form of this formula is

FORMULA 6

$$cfm = \frac{Btu_t}{Hd \times 4.5} \text{ where}$$

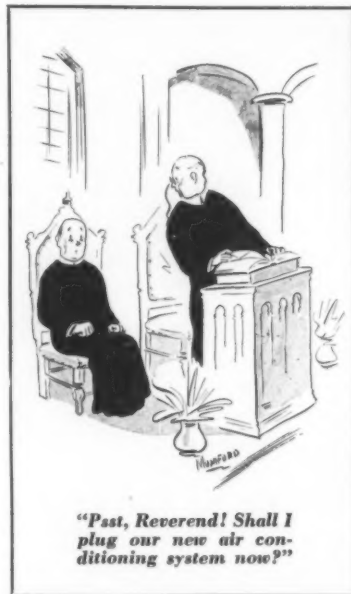
Btu_t = total room heat gain, Btu per hour
 Hd = difference in heat content between room air and supply air, Btu per pound of dry air

Substituting known values in this formula, we have

$$2960 = \frac{100,000}{Hd \times 4.5}$$

$$Hd = 7.5$$

The difference in heat content between room air and supply air is, therefore, 7.5 Btu per pound of dry air. Inasmuch as the heat content of the room air at 67 F wet-bulb is 31.54 Btu per pound of dry air, the heat content of the supply air will be 31.54 - 7.5 = 24.04 Btu per pound of dry air. This corresponds



be less than called for by design conditions.

It thus becomes evident that the arbitrary selection of supply air dry-bulb temperature will not always produce desired conditions in a room. The same would be true if supply air volume or supply air wet-bulb temperature were arbitrarily chosen. In what follows, we shall discuss a scientific method for the selection of supply air temperatures.

DETERMINATION OF SUPPLY AIR TEMPERATURES: Before selecting equipment for comfort cooling installations, the dry- and wet-bulb temperatures of the air supply must first be determined, after which the necessary air volume may be calculated. The relationship between the dry- and wet-bulb temperatures of the air supply may be derived by dividing Formula 5 by Formula 6, resulting in the following formula:

FORMULA 7

$$\frac{Btu_s}{Btu_t} = \frac{.24 \times td}{Hd}$$

It should be noted that the first term of this formula, $\frac{Btu_s}{Btu_t}$, represents the ratio of the room sensible heat to the room total heat, which we have defined in Part I as the *room sensible heat ratio*. Therefore, if we let "SHR" represent the term *room sensible heat ratio*, Formula 7 may be rewritten as follows:

FORMULA 7A

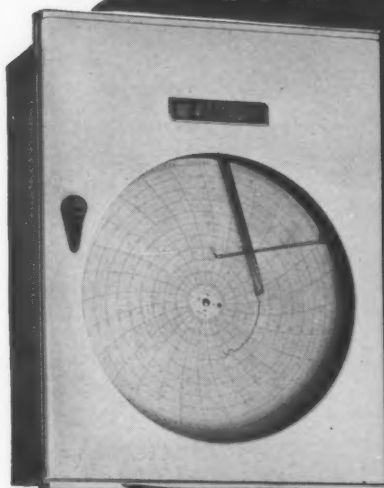
$$SHR = \frac{.24 \times td}{Hd}$$

Formula 7a shows that the required temperature conditions for the supply air are the same for all rooms with the same design temperatures and the same room sensible heat ratio, regardless of the size of the room or any of its other characteristics. Once the sensible heat ratio for a room has been calculated, Formula 7a may be used to calculate the required wet-bulb temperature of the air supply for any given dry-bulb value, or the required dry-bulb temperature for any given wet-bulb value. As has been shown in the preceding paragraph, a non-feasible set of temperature values may result if an air supply temperature is chosen at random.

Continued on page 70

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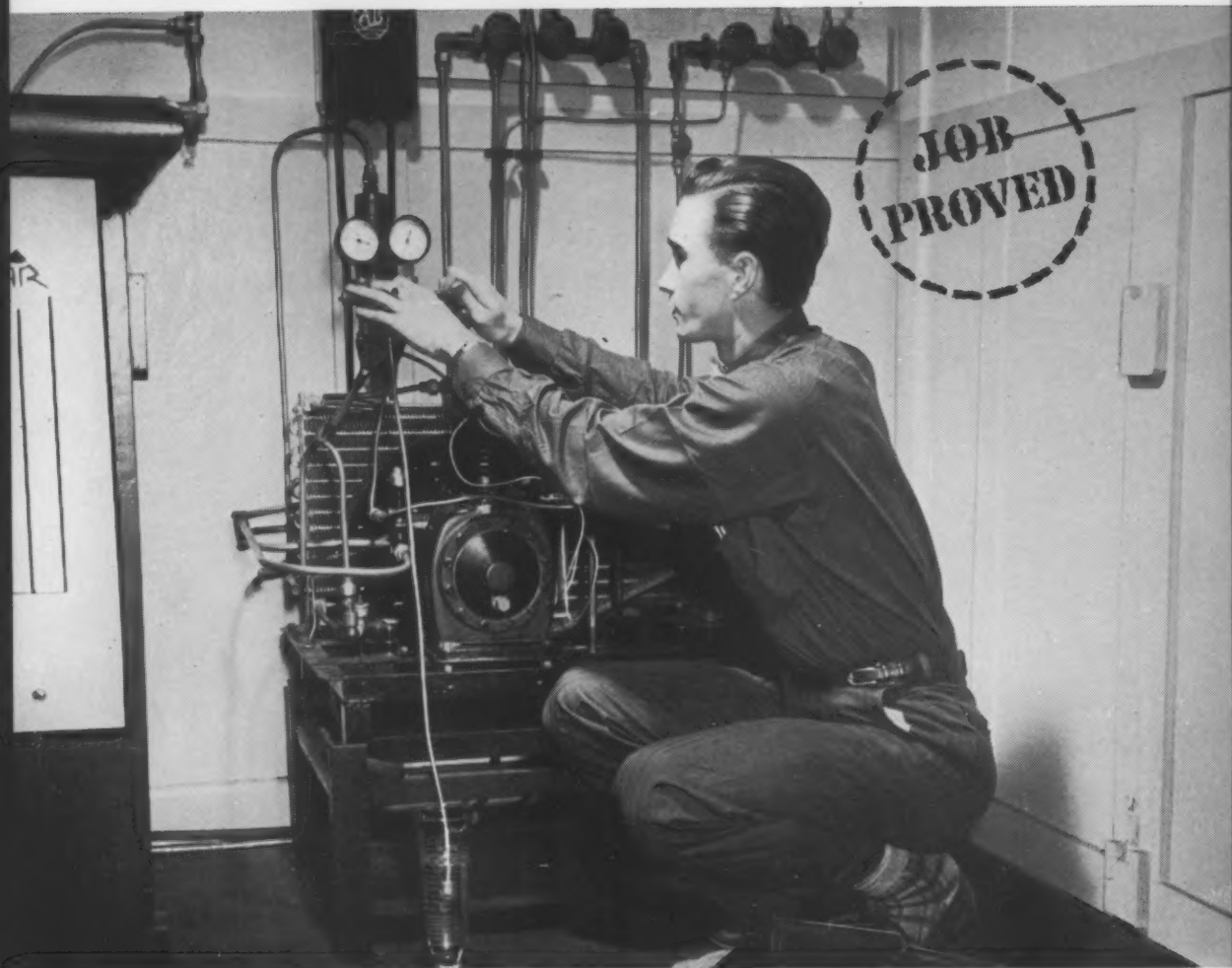
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H. C. Patterson has been appointed commercial sales manager and **D. A. Packard** has been named



Mr. Patterson



Mr. Packard

household sales manager of Kelvinator Division, Nash-Kelvinator Corp. Mr. Patterson served as Kelvinator's western regional manager prior to his new appointment. He had joined the company in 1937 as a district manager. Mr. Packard, assistant general sales manager since 1944, joined the company in 1940 as eastern sales manager.

K. M. Newcum has resigned as vice president of Superior Valve & Fittings Co., Pittsburgh manufacturer of refrigeration equipment, without announcing any future plans. Mr. Newcum had been with Superior since 1938. He has been connected with the refrigeration industry since 1927, having served as eastern representative for Kerotest Mfg. Co., eastern district manager for Zero Plate Corp., and with a number of service organizations, including his own.

Several personnel changes have been announced by General Engineer & Mfg. Co., St. Louis manufacturer of compressors and packaged air conditioning units. **Willard R. Vogel**, vice president, has been appointed general manager. **Arthur H. Huhn**, who was active in the development of the Gemco air conditioner, has been named manager of the air conditioning and research

department. **J. York Hewitt**, formerly with D'Arcy Advertising Co., has been appointed sales manager for the air conditioning division. **Frank A. Wagenfuehr** has joined the organization as comptroller.

E. A. Bonneville has been appointed sales manager of the unit air conditioning division and refrigeration division of Fedders-Quigan Corp. Mr. Bonneville formerly was associated with the sales division of Crosley Corp.

G. F. Jenkins has been appointed national ice cream cabinet sales representative for Frigidaire Division of General Motors Corp. Mr. Jenkins, who was formerly assistant supervisor of parts sales of the company's service department in Dayton, has been associated with Frigidaire since 1933.



Leonard K. Wright, Jr., Alco Valve Co. representative in the southern territory, with headquarters in Knoxville, Tenn., has been transferred to Columbus, Ohio, succeeding Hugo C. Smith, of Cleveland, in the Ohio territory, which also includes western Pennsylvania and West Virginia, and eastern Michigan. Succeeding Mr. Wright in the southern territory is **William B. Knox** of Atlanta, Ga.

Kelsey Lingo has been appointed purchasing agent for the refrigeration division of Bowser, Inc., Terryville, Conn., succeeding Paul Rothman, who is no longer with the division.

Several shifts in personnel have been announced by Bush Mfg. Co.



In the most important of these changes, **Frank T. Carney**, works manager, has been appointed to the position of assistant secretary of the firm. He will continue in his capacity as works manager in the company's new plant. In the reorganization necessitated by a consolidation of the firm's three plants, the former plant superintendents have been assigned new duties as follows: **Joseph F. Fagan**, methods development engineer and assistant to the works manager; **Harry C. Kromas**, manufacturing superintendent; **James F. Coffey**, assistant to the manufacturing superintendent.

Bertram Friganza has been appointed assistant to the president of Coolstream Corp. Mr. Friganza formerly was associated with Refrigeration Corp. of America as service manager, and with the Long Island City branch of the Charles E. Hires Co. water cooler division.

A. J. Mallinckrodt has been appointed manager of application engineering for Baker Ice Machine Co., Inc. In his new position he will be responsible for all phases of the company's equipment application program, including the training course for student engineers. Mr. Mallinckrodt has been with the company 16 years.



F. E. Ross has been named supervisor of household refrigerator advertising for the Westinghouse Electric Appliance Division, succeeding R. G. Hiatt, who resigned. In this capacity, Mr. Ross will correlate the work of the division's advertising agency with

Continued on page 83



You don't have to be big to be good. From this location, Branson Refrigeration sells refrigeration equipment, frozen foods, and operates a complete locker storage plant.

it pays to

Practice What You

Don't sell refrigerators; sell "refrigeration" — and don't stop with the equipment sale. Follow through with a complete service that shows customers how to use what they've bought. Here's the account of how this policy has paid off for one small-town dealer.

By L. H. Houck

DON'T just sell refrigerators; sell refrigeration. Instead of merely preaching food preservation or storage, show customers you know what you're talking about by actually doing food processing; and educate your customers in how to get the greatest benefit from the equipment you've sold them.

A "practice what you preach" foundation of this sort has played an important part in the success of Branson Refrigeration Appliance Co. Lo-

cated in Branson, Mo., a resort town of 1200 people in the Ozarks territory, this unusual dealership is owned by Jack Griffith, who started his business August 25, 1945, with a background of 20 years' experience in selling commercial refrigeration.

Here are the services that Mr. Griffith provides for his community nad the county of 10,000 population of which Branson is the trading center:

He operates a complete refrigeration sales and service dealership in both commercial and household refrigeration. His service shop is equipped to install and maintain all types of refrigeration equipment; it's the only service operation in the area.

He operates a locker storage plant of more than 300 lockers capacity, complete with processing facilities.

He sells farm freezers, plus a line of walk-in units for use by farmers and others who need to store meats in quantity.

In addition to frozen foods which he processes at the plant, he sells commercially-packed frozen foods, both to his own refrigeration equipment or locker patrons and to restaurants and other commercial establishments in the area.

He operates a wholesale meat business for some 50 restaurants in his territory, buying inspected beef from meat packing houses and processing it into roasts, steaks, chops and ground meat for resale to these customers.

Besides processing frozen foods for his customers, if they want him to, he also instructs them on how to do this job for themselves, with the assistance of Mrs. Griffith, who attends all the short courses given annually

Jack Griffith sells a freezer to a farm customer. Farmers who buy a freezer from him get a discount on frozen foods, all the advice they want on proper use of the unit.



reach

in Missouri, Kansas and Oklahoma to keep up-to-the-minute on the latest developments in food freezing and canning.

Use of the facilities of the community canning and freezing room, which Mrs. Griffith supervises, is available to customers without charge. Charges are made only for the actual processing which the locker plant does for the customer, and for the packaging materials used.

Branson is one of the best known fishing spots in the Ozarks, but until Mr. Griffith made frozen fish available to restaurants through his processing and storage services, about the only way you could be certain of getting fish at an eating place was to catch one and bring it in yourself. Often the local catch wasn't plentiful enough, so Mr. Griffith arranged to have it brought in from outside. This business now amounts to between 700 and 1000 lbs. a week—and it's frozen fish, of course. Naturally, restaurants need refrigerating equipment to keep their frozen fish; and Mr. Griffith was glad to supply this, too, plus any service required to keep it in first-class operation.

Mom Johnson's pies are well known to vacationers who come to this area; but you used to be able to get them only when the fruit used in them was in season, for the secret of the pies' flavor was fresh fruit. Now all that has been changed. You can get a Mom Johnson pie any time you want one—strawberry, blackberry, peach—because Mr. Griffith processes the fruits in season and stores them in his locker plant until they're wanted.

Blackberries, both wild and cultivated, grow abundantly in the region. Anybody who picks them and brings them in to Mr. Griffith's locker plant will be instructed and aided in processing them. Then they can either be stored in the locker plant or in the customer's freezer at home. Mr. Griffith also packs local-grown blackberries, peaches and strawberries,



mostly in 30-lb. containers for hotel and restaurant use.

In connection with his activities in supplying meats to restaurants, mentioned previously, Mr. Griffith has been processing and freezing Ozark broadbreasted turkeys as a holiday special. Now he has a plan to sell half a turkey, split down the middle, to provide smaller families with a 10 to 15 lb. bird, the size most popular with them.

In December, 1945, a few months after he had opened his business in Branson, the weather turned unreasonably warm and neighboring farmers flocked to Mr. Griffith for help in processing their hogs; normally they did this job themselves, but the twist in the weather upset their plans. Mr. Griffith did the processing job, and used the opportunity to point out the need and use of refrigeration in this respect, and to sell his processing service as a regular thing. By comparing the proper method with the way they'd been doing it formerly, he was able to show them that, when he did the job, the savings more than paid the processing cost.

To farm families buying freezers from him, he allows a 5% discount on all frozen foods purchased. Mr. Griffith's "complete service" even is carried out to the extent of advising the best kind of corn to plant to get highest quality in the frozen product.

Continued on page 65

Frozen foods sales go right along with refrigeration, Mr. Griffith believes. Here he sells a package of frozen strawberries to a customer.

As part of his complete service in things refrigerated, Mr. Griffith has had a wide success with freezing of Ozark broadbreasted turkeys.



*No Springs
★
Either-Way
Flow**

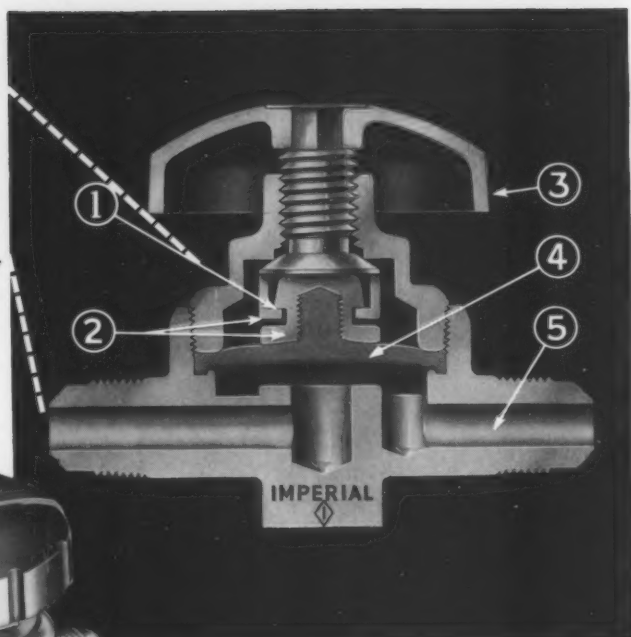


Both internal parts of the DiaSeal lift out with the bonnet, facilitating soldering in line. Extremely low height cuts installation space.

Ask for Bulletin 103-REF

See Your Jobber

IMPERIAL



*... *Because direct lift provides positive control*

• Built along entirely new principles, the Imperial DiaSeal Valve has a sturdy, "million cycle" diaphragm that is operated by positive mechanical action in both opening and closing the valve. *No springs are used.*

Features that make the DiaSeal the outstanding valve for refrigeration service are readily apparent in the sectional view:

1. **NO SPRINGS**—DiaSeal Valve cannot "stick shut" because diaphragm is lifted mechanically. Positive control with flow in either direction.
2. **ONLY TWO MOVING PARTS**—Simple construction assures greater dependability.
3. **EASY FINGER-TIP ACTION**—Quick, sure opening and closing with less than two turns of handle.
4. **LONG LIFE DIAPHRAGM** is impervious to all common refrigerants. In actual tests, has withstood over 1,000,000 openings and closings under refrigerant pressure.
5. **INLET AND OUTLET PORTS IN LINE.** Simplifies installation.

Furnished in 2-way and angle types, with either flare or solder connections. The Imperial Triple Seal Groove is an added feature on flare connections $\frac{3}{8}$ " and larger.

THE IMPERIAL BRASS MFG. CO., 536 S. Racine Ave., Chicago 7, Ill.

FITTINGS • VALVES • FILTERS • FLOATS
DEHYDRATORS • CHARGING LINES • TOOLS
FOR CUTTING, FLARING, BENDING, PINCH-
OFF AND SWEDGING.



REFRIGERATION INDUSTRY

News

FIRST CENTRIFUGAL UNIT STILL IN USE

Now 25 years old, the first centrifugal refrigerating machine ever built is still operating efficiently in the ceramic lithographing plant of the Onondaga Pottery Co., Syracuse, N. Y.

Viewing this installation recently, Dr. Willis H. Carrier, designer of the machine, reminisced:

"This compressor was built to our specifications in Europe. There was no one we could find to build it in the United States, therefore in 1921 I went to Switzerland and then to Germany. The Jaeger firm at Leipzig took our order, and the centrifugal unit was installed to air condition the Carrier offices in Newark, N. J., in 1922.

"In 1925 we sold it to the Onondaga Pottery Company, putting in a new model at Newark."

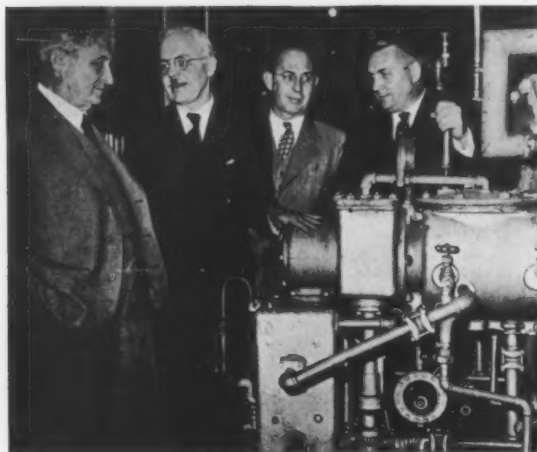
The machine is a centrifugal pump, causing a flow of dichlorethylene in a cycle of compression of gas into liquid, condensation, evaporation, and expansion

CANADIAN R.S.E.S. MEET MARCH 16-17

The eighth annual refrigeration convention sponsored by the Interprovincial Association of the Refrigeration Service Engineers Society will be held March 16 and 17 at the Mount Royal hotel, Montreal. Registration will commence Saturday, March 15. A new program, new speakers, and new entertainment are promised.

into gas. A reciprocal pump system was used before the centrifugal system was devised by Dr. Carrier.

The pioneer centrifugal machine in the pottery plant has a capacity of 70 tons of refrigeration. It makes possible the maintenance at a constant temperature, varying not more than 2° F, plus or minus, regardless of outside temperatures, and also a constant humidity varying not to exceed two per cent. Maintenance of such close tolerances is essential to successful operation in the lithographing plant.



Inspecting the first centrifugal refrigerating machine ever built are Dr. Willis H. Carrier; Richard H. Pass, president of Onondaga Pottery Co.; Lloyd L. Downing, president of the Central New York section of ASRE; and R. Wayne McLaughlin, Carrier engineer in charge of centrifugals. Designed by Dr. Carrier 25 years ago, this unit is still in use in the pottery plant.

INDUSTRY MILESTONES

8 MILLIONTH UNIT MADE BY FRIGIDAIRE

Frigidaire Division of General Motors dramatically closed its books on the old year and climaxed more than a quarter century of production December 31 when its eight millionth electrical refrigeration product—a household refrigerator—rolled off the assembly line at the giant Moraine City plant.

E. R. Godfrey, general manager, P. M. Bratten, general sales manager, and 12 other high company officials were on hand to witness the event.

Mr. Godfrey pointed out that the company reached the seven millionth mark late in 1941 shortly before the Frigidaire plants turned from peacetime to war production. Reconversion was started in July of 1945.

Frigidaire is now ranked as the fourth largest division of General Motors, employing more than 18,500 workers. Of the original group of employees instrumental in building the first production model Frigidaire electric refrigerator, 100 still remain on the job.

NORGE LINE MARKS 20th ANNIVERSARY

The Norge division of Borg-Warner Corp. has introduced to the trade its 1947 "20th Anniversary" line of household appliances high-lighted by a brand new 9-cu. ft. refrig-

PROBLEM POSED

"What would we do if all the equipment we have been clamoring for were suddenly made available?"

That was the problem posed by J. S. Hopper, assistant to the dean of engineering at Texas A & M College, when he addressed a recent meeting of the Dallas-Fort Worth section of the American Society of Refrigeration Engineers on the subject of "Application and Service". And the question left many members of the group wondering if their engineering and service departments could cope with such a situation.

erator with large frozen food storage space

Announced in connection with the showing of the products to distributors and retailers at the Mid-Winter Furniture Show in Chicago's American Furniture Mart, the new products are added to an already comprehensive line of Norge major household appliances.

The new refrigerator has an "across-the-top" frozen food storage compartment which has a capacity of approximately 35 pounds of food. This model, and another of the company's refrigerators which has a vertical frozen food storage arrangement, were designed to hold large quantities of frozen foods in response to public demand.

SEEGER COMPANY CHANGES NAME

Name of the Seeger-Sunbeam Corp. has been changed to Seeger Refrigerator Co. to eliminate some confusion resulting from the name "Sunbeam" also being used by another manufacturer. There has been no change in company policy or personnel.

Seeger manufactures the Coldspot refrigerator for Sears-Roebuck, in addition to the Seeger line of commercial refrigeration equipment. General offices are located in St. Paul, with factories in that city and in Evanaville, Ind.

NEW SHIPPING CASE HOLDS 80° T.D

A pioneer development in shipping containers that, without use of a mechanical refrigeration system, are said to be able to maintain critical temperatures for air shipment of perishable foods and other products, is the new Fiberglas-insulated container manufactured by Santi-Kraft Corp., Fort Worth, Texas.

Over-all dimensions of the container are 4 by 4 by 4 feet. The side that can be opened is fitted with pressure-seal, rubber-covered zippers to prevent leakage of air into the container. In the top of the container are 6 pockets for the insertion of slabs of dry ice, 1 by 10 by 10 inches.

Fitted with 6 slabs of dry ice, the container's inside temperature will drop 80° below atmospheric temperature in 1½ hours, and will hold this differential temperature for 8 hours, the manufacturer states. At the end of the 8-hour period the temperature within the container will start to rise at the rate of 5° per hour.

With each container, a table is supplied which makes it possible to determine the amount of dry ice needed for a given shipment when it is known at what temperature the contents should be shipped and the time the contents must remain at or below this temperature.

* * *



U.S. RIGHTS GRANTED FOR ALUMINUM SOLDER

Exclusive manufacturing and distribution rights in North and South America for a new aluminum solder, called Prolyt, which uses no flux or flux substitute, have been given to the Aluminum Solder Corp. by Handex AG of Zurich, Switzerland, according to Hazard E. Reeves, president of the American concern.

Walter Shaffner and Hermann Grunauer, Swiss engineers who developed the solder for Handex AG during the war to permit a wider use of aluminum and copper which are not scarce metals in Switzerland, recently arrived in this country to assist in the establishment of a manufacturing plant and to act as consultants on the use of Prolyt.

"By making this new solder available to American manufacturers," Mr. Reeves said, "application possibilities for aluminum are greatly expanded. Prior to the development of Prolyt, aluminum solder often required a flux and was subject to excessive corrosion. With Prolyt, however, sheet aluminum, electrical wiring, or any other aluminum equipment can be soldered with greater simplicity and with far less danger of corrosive agents weakening or marring the joints."

HAROLD STERN OPENS BRANCH IN BOISE

Harold G. Stern, owner of Refrigerative Supply, Inc., Seattle, Wash., wholesaler of refrigeration parts and supplies, has announced opening of a branch at 1210 Grove St., Boise, Idaho.

This Boise branch is the sixth jobbing outlet to be opened by Mr. Stern's organization. Other branches are located in Spokane and Tacoma, Wash., Portland, Ore., and Vancouver, B. C., Canada.

W. ALLEN ROGERS ADDS MARVEL LINE

Manufacture of the Marvel line of refrigeration units and farm equipment now is under the management of W. Allen Rogers Industries, Inc., Demopolis, Ala. The Rogers firm will continue to promote the entire Marvel line, which includes beverage coolers, quick freeze units, and walk-in and reach-in refrigerators.

FRIGIDAIRE MAKING DISPLAY CASE LINE

Limited production of a new line of gravity-cooling and forced-air type display cases for groceries and markets has been started by Frigidaire Division of General Motors, P. H. Brennan, commercial sales manager, announced recently. He predicted that demand would exceed production for some time.

Mr. Brennan pointed out that six, eight and 10-foot gravity-cooling models are being built in very limited quantities along with eight and 10-foot forced-air display cases. "Production will be stepped up as fast as possible," he explained.

All models are equipped with sliding service doors, modern fluorescent lighting, and full-view display windows, consisting of three layers of glass. A built-in ventilation system prevents fogging of glass.

NEW LOCKER FIRM

J. Benjamin, H. H. Blum, and Philip Israel have organized the Corpus Christi (Tex.) Cold Storage and Locker Co.

TRADE NOTES FROM SOUTH AMERICA

Argentina

Latest advice from Argentina, according to the Bank of the Manhattan Co., New York City, is that as of Jan. 6 importers will not be able to clear goods through customs without the original bill of lading, legalized commercial invoice in duplicate (duplicate to be stamped "Para Estadística") and legalized consular invoice in duplicate. If the bill of lading is not presented to the customs within eight days of the steamer's arrival, the importer will be subject to a 2% fine.

This new regulation abolishes the practice of allowing storage of goods at customs without documents, granting a six month period for presentation of documents and releasing goods without documents under a bank guarantee.

Brazil

Shippers also are reminded by the Bank of Manhattan Co. of the importance of prompt dispatch of documents covering shipments to Brazil. Brazilian law penalizes lack of a certified invoice, or one certified after the shipment's arrival, by a customs fine equal to the import duties assessed. The law is strictly enforced and if the properly certified consular invoices do not arrive in Brazil before the merchandise they cover, there is no relief.

Refrigeration equipment is listed among an additional 39 items which have been exempted from the requirement of paying for them within 30 days of customs clearance under penalty of a 1% per month fine.

BUSH NET SALES HIT 3½-MILLION

Total net sales of \$3,468,802 and a net income of \$96,844 has been reported by Bush Mfg. Co. for the year ending last Sept. 30. Sales for the preceding year were \$5,665,921, and income totaled \$146,965.

FREEZERS TESTED ON PRODUCTION BASIS

Laboratory testing on a production-line basis has been inaugurated by Ben-Hur Mfg. Co., Milwaukee, Wis., to insure adherence to the rigid performance standards prescribed for the company's line of farm and home freezers.

Ordinary testing methods proved inadequate when it was decided to make a complete record of the efficiency of every freezer before it leaves the plant.

Now these freezers move from final assembly along one of many conveyor platforms into a huge testing laboratory equipped with the latest testing and recording equipment. Each unit is connected to a separate set of instruments and is tested separately under the watchful eyes of engineers.

Any necessary minor adjustments are made at this time, while cabinet temperatures are recorded with room temperatures varying to the extremes possible in actual home use. The test rooms are capable of simulating every possible operating condition. Each cabinet spends approximately 18 hours undergoing this rigid routine.

N.Y. COMM'L DEALERS NAME NEW OFFICERS

New officers for 1947 have been elected by the Commercial Refrigerator Distributing Association, Inc., representing this type of outlet in the greater New York and New Jersey area.

Names and company affiliations of these officers follows: president, Joseph S. Lipack, Super-Cold New York Co., Inc.; vice president, John Poth, A. C. Wicke Mfg. Co.; secretary, E. C. Newton, Engineering & Refrigeration Co.; treasurer, Barnett Berch, Schultz Associates.

There was only one change in the organization's board of directors, with Harry Culbertson of McCray Refrigerator Co. being the new man. In addition to Mr. Culbertson, Mr. Lipack, Mr. Poth, and Mr. Newton, Clayton Webb of C. V. Hill & Co., Inc., completes the board.

FIRM PRICE POLICY SET BY WORTHINGTON

Worthington Pump & Machinery Corp., has announced today that effective January 2, 1947, prices of all Worthington products will be quoted on a firm basis, that is, not subject to any increase above the prices in effect on the date the order is placed, except for the prices of major purchased components, such as motors and other electrical equipment, and steam condenser tubes. On such items it will be Worthington's policy to quote similar price protection as that required by its suppliers.

GODFREY NAMED V.P. OF GENERAL MOTORS

E. R. Godfrey, general manager of Frigidaire, has been elected a vice president of General Motors Corp. Mr. Godfrey, who will continue in his present position at Frigidaire, is also serving as chairman of the General Motors Plant City committee in Dayton.

Mr. Godfrey has been with General Motors and one of its predecessors, the old Remy Electric Company at Anderson, Indiana, for 28 years. He has headed the Frigidaire Division since 1943.

'ESTATE' FREEZERS MAKE BOW AT MACY'S

Estate home freezers in 6 and 12-cu. ft. sizes have been introduced to the public at the R. H. Macy & Co. department store in New York City. The models were priced at \$239 and \$399, respectively.

This sale at Macy's is the first of a series of five market tests which are being made prior to the full-scale sales campaign. Other cities selected for the test are Atlanta, Chicago, Cincinnati, and Los Angeles.

TEX. PLANT PLANNED

Douglas and Gwendolyn Anderson and Dewey Cox, Jr., have incorporated the Ranger (Tex.) Frozen Food Lockers, Inc., with \$10,000 authorized capital stock.

TWO-ZONE COOLING USED IN TRUCKS FOR HOME DELIVERY OF MEAT PRODUCTS



Here is the type of refrigerated truck used by a Brooklyn meat packer for home delivery of meat products and frozen foods.

Two-temperature refrigeration is a feature of the fleet of route trucks for home delivery of meat products and frozen foods which have been ordered by Adolf Gobel, Inc., Brooklyn meat packing house.

These trucks have short, light-duty chassis and over-size stock bodies in which refrigeration equipment and insulation are installed to insure sub-zero temperature for some products and 28° F for other products in the same loads. They will be used for delivery of the company's products direct from the packing plant to customers' homes.

The main load compartment is insulated with 5 inches of packed fibre glass in the roof and 4 inches in the walls, doors and partitions. In the floor, 4 inches of cork, covered with diamond plate steel panel is used. In this main compartment it is only necessary to provide a temperature of 28° F to start and the trucks return with about 34° F.

There is a special compartment with extra insulation for frozen foods (vegetables and fruits) which are carried by Gobel as a convenience to housewives. This cabinet, 21x21 inches x 2½ feet high is situated directly above the refrigerating unit, and provides a sub-zero temperature.

The refrigerating unit, using a 1½-hp. motor and a 2-ton condenser, is on the left side and directly behind the driver's compartment and can be reached



A route salesman removes some packages from the racks built into truck's interior.

from the outside through an access door. If a route truck should develop trouble on the road, this refrigerating unit can be plugged in at the service station to protect the payload.

The evaporating coils or plates are located on the sides of the load space, directly behind the four shelves or racks on each side, leaving a wide center aisle for access to the load.

WEBER BUYS COAST REFRIGERATOR FIRM

Purchase of Calplastic Corp., Los Angeles manufacturer of a portable plastic refrigerator, has been announced by Weber Shewcase & Fixture Co. The purchase was effected with 3,162 shares of Weber stock created under a new recapitalization plan.

FRIGIDAIRE OFFERS FREE STUDY COURSE

A basic step-by-step home study course is being offered without charge to ice cream manufacturers to train servicemen by Frigidaire Division of General Motors.

This course, which covers the history of refrigeration, theory and principle, electrical and mechanical aspects of ice cream cabinet operation, is contained in a single, illustrated text comprised of 20 lessons. A practical test for the student serviceman follows each chapter. These textbooks are being forwarded to all Frigidaire district offices for distribution to ice cream manufacturers upon request. A training film, entitled "Service Operations on Ice Cream Cabinets," is also being distributed to augment the home study course.

YORK NETS PROFIT OF \$1,279,469

York Corp. reports net earnings for the fiscal year ended September 30 of \$1,279,469 or \$1.37 per share. This includes a return to income of reserves for wartime contingencies of \$253,004 or 27c per share. Net earnings for the previous year were \$949,718 or \$1.02 per share.

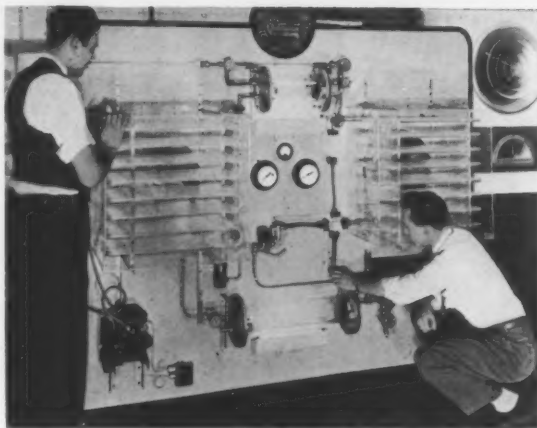
Net sales on which income was recorded were \$32,052,000 compared to \$38,365,127 in the previous year. This shrink resulted from inability to maintain steady, balanced production due to short and irregular supply of raw materials and components.

ORLEY FREEZER ADDS FOUR NEW DEALERS

Four nationally-known retail firms have been added to the dealer network selling the new Orley home freezer.

Recently franchised are: The May Co., Baltimore; The J. L. Hudson Co., Detroit; Marshall-Field & Co., Chicago; and The American Service Co. and its 51 branches in Kansas, Iowa, Oklahoma, Missouri, Arkansas, Georgia, Tennessee, Texas, Alabama, North Carolina, Virginia, West Virginia, and Louisiana.

PLEXIGLAS COOLING UNIT USED BY YORK



A model evaporator and condenser has been fabricated for York Corp. to use in the instruction of their distributor, branch sales and service personnel.

The refrigeration apparatus is mounted on a six foot board and designed to provide student personnel of the corporation with practical information on the operation and maintenance of York equipment. As students watch, a gas refrigerant begins its cycle of operation, flowing through the crystal clear Plexiglas tubes until, by compression, it changes into a liquid form. In this form, it flows around the

object to be refrigerated, where it evaporates back into its original gaseous state, the physical change resulting in the refrigerating action. The Plexiglas is not discolored or otherwise affected by the refrigerant.

During the entire operation cycle, students are able to observe every phase of the process through the shatter-resistant Plexiglas tubes. These demonstrations have proven invaluable in instructing new personnel on the "know how" of York apparatus, as well as bringing older personnel up-to-date on the latest methods for servicing York units in the field.

SOUTHERN FARMERS WANT COOLING

Electric refrigerators rank high on the list of appliances most desired by Southern farmers, according to the results of a survey completed by *The Progressive Farmer*, a Southern farm and home magazine with 1,000,000 subscribers. A marked interest in home freezers also was shown.

This information is based on a survey of a cross-section of the magazine's subscribers, representing farm wives in 14 Southern states. Each subscriber polled was asked what items she expected to buy when they could be had.

Of the 39.8% who expected to buy refrigerators, 25.9% wanted electric refrigerators. It is estimated that 9% of all families surveyed are in the market for home freezers.

REFRIGERANT FIRM NAMES NEW AGENCY

Gray & Rogers, Philadelphia, has been appointed to handle advertising for Virginia Smelting Co. of West Norfolk, Va., refrigerants manufacturer.

KOLD-HOLD OFFICIAL KILLED IN CRASH

Fred E. Heldrich, assistant treasurer of Kold-Hold Mfg. Co., Lansing, Mich., and his wife, Hulda, were killed in an automobile accident December 9 near Cordele, Ga.

Mr. and Mrs. Heldrich were enroute to Florida on a vacation when they crashed broadside into a Georgia highway department truck. They were 55 and 54 years of age respectively.

SEVEN NEW MEMBERS ELECTED TO REWA

Seven new members from coast to coast have been elected to membership in the Refrigeration Equipment Wholesalers Association.

These seven firms, with their locations, are listed below: Central Plumbers Supply Co., Inc., Port Chester, N. Y.—Robert F. Ives, association representative; Wholesale Distributors, Inc., Jamaica, N. Y.—Murray Bergman, president; Budlock Refrigeration Supply Co., Evansville, Ind.—Ian F. Lockhart, president.

Hays Electric Service, El Paso, Tex.—J. E. Hays, owner; Refrigeration Parts & Supply Co., Albuquerque, N. M.—A. J. Palkovic and Arturo Garcia, partners; Rauch & Monroe, Oakland, Calif.—Jess E. Rauch and Jas. O. Monroe, partners; Van's Supply, Long Beach, Calif.—Garritt Van Ginkel, proprietor.

ARMSTRONG OFFERS INSULATION FILM

A 35 mm. sound-slide film, "The Inside Story," has been produced by the equipment insulation department of Armstrong Cork Co. and is being distributed to manufacturers of refrigeration equipment to assist them in training retail salesmen.

Made with a new technique in sound-slide films, "The Inside Story" runs 12 minutes and presents the highly technical theories of equipment insulation in a simplified way, so that retail salesmen could easily absorb the subject and be in a position to discuss insulation accurately with their prospects.

Although the film was based on the requirements of domestic refrigerator manufacturers, the film can easily be adapted for use by manufacturers of farm freezers, milk coolers, ice cream cabinets and other equipment. The film can also be used to provide ideas for the advertising departments of commercial refrigerator builders.

Prints of "The Inside Story" may be obtained by contacting one of the district offices of the building materials division of Armstrong Cork Co.

McCOMBS ADDS HOUGHTON AS COUNTER MAN

R. L. (Lick) Houghton has joined the staff of McCombs Refrigeration Supply Co., Denver wholesaler of refrigeration parts and supplies, as a counter man.



Mr. Houghton is well known to the refrigeration trade in this area, as well as in St.

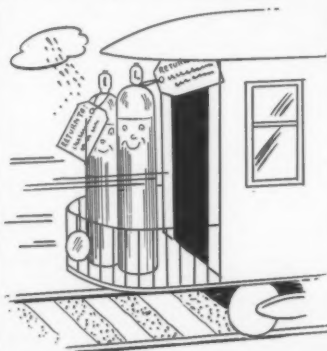
Louis and Kansas City, having served as a distributor's counter man in all three of these cities.

Mr. Houghton also is secretary of the Mile High Chapter of the Refrigeration Service Engineers' Society.

PUBLIC RELATIONS CHIEF

Don Sutton, formerly editor-in-chief of NEA Service and during the war a correspondent in the European and Mediterranean areas, has been named public relations counselor for Borg-Warner Corp., according to C. S. Davis, president.

YOU can help to prevent a shortage of refrigerants next summer by seeing that all empty cylinders in your possession—or that you know of—are returned to the



manufacturers promptly for refilling.

All manufacturers of refrigerants have new steel cylinders on order, but deliveries have been delayed and may drag on for several months. Consequently, it's very important to keep those old cylinders "working."

Round up those empties, and start them on their way back "home." You'll be glad you did, when summer comes!

Here's Sweet Music

Says the LEHIGH TEAM

Our outlets report that during 1946 *Lehigh* **BLU-COLD** had the **smallest** percentage* of field failures in the industry

*Percentage available on request

That means BLU-COLD sellers and users had **LESS SERVICING**, fewer disappointments, more satisfaction . . . and made **MORE MONEY** in 1946.

That's the kind of music we all need in this business . . . and we are going to give you more of it in '47.



1/4 to 1 H. P. Now Coming Off The Production Line. Complete Line To Include Up to 5 H. P.

Lehigh Manufacturing Co. PLANT: LANCASTER, PA.

INCOME TAX . . .

Continued from page 31

for \$900. As the truck was laid up for repairs several times during the year, the taxpayer's private car was used during such periods for light deliveries, and it is estimated that, therefore, the private car was used $\frac{1}{4}$ of the time for business purposes.

Fixtures, equipment and other depreciable items represented an outlay of \$3,000, also in 1942, and were second-hand when acquired and, for

sake of illustration, all have a normal life of 10 years.

During 1946 he paid a \$60 insurance premium on the building. Repairs to the building (all necessary maintenance, as distinguished from capital improvements, such as alterations and additions) cost him \$450.

In addition he finds that he has spent \$150 during the year to entertain preferred customers.

Now this taxpayer, brushing aside these cost-of-doing business items as of no importance, finds that by ignoring them he has—on paper—an in-

come of \$5,000 in 1946. He has deductions for contributions, property taxes, medical expenses, etc., of \$500. Besides his wife, he has three dependent children. Taking these personal exemptions and deductions into consideration, his net income subject to normal and surtax is \$2,000. His normal and surtax is \$400 and, for all the author knows to the contrary, such a hypothetical taxpayer might feel pretty good about it. After all, thinking that he has a \$5,000 income, this taxpayer figures that the government has left him with \$4,600 after income taxes.

If, however, this taxpayer had taken full advantage of depreciation and other legitimate unrecorded expenses he would have found that his seemingly handsome income of \$5,000 was, in reality, only \$3,715. Like a hibernating bear, the \$1,285 differential between the illusory \$5,000 and the real \$3,715 income is his own fat that he has been living on and, more important, paying tax on to boot! If he goes ahead and pays on a \$5,000 income when it is really only \$3,715, this taxpayer will wind up after taxes with only \$3,315 instead of \$4,600.

Here, if he really wants to get a true picture of his net income, are some of the additional business expenses that such a taxpayer must report in his income tax return. These are the items which, if not reported, boost his reported NET income and result in his paying a tax on depreciating assets and on other hidden current expenses.

20% depreciation on delivery truck	\$150.00
$\frac{1}{4}$ of 20% depreciation on passenger car (\$180)	45.00
% of 4% depreciation on building (\$300)	200.00
% of insurance premium (\$60)	40.00
% of building maintenance (\$450)	300.00
$\frac{1}{2}$ utilities on one meter (\$200)	100.00
10% depreciation, equipment, fixtures	300.00
Business entertainment	150.00

Total additional business expenses \$1,285.00

Now let us look at this taxpayer's revised income tax return. His income subject to the normal and surtax has been reduced from \$2,000 to \$715.

His income tax now figures \$143

Long needed . . . HERE IT IS!

DFN MOISTURE INDICATOR*

Quick . . . simple . . . low cost method of detecting moisture in Freon and Methyl Chloride Systems

LABORATORY ACCURACY ON THE JOB!



This cartridge tells the story in a few seconds!

● Slightest moisture is indicated by change in color of chemical in glass cartridge. Base material of chemical is "Drierite", specially processed

THE new DFN Moisture Indicator tells instantly whether system is wet or dry. No need to shut down unit. Avoids moisture troubles in new installations; big time-saver diagnosing service failures in old systems. Demonstrated with great success to thousands at the All-Industry Show. Easily-assembled parts and cartridges packed in handy service kit. Ask your jobber—or write us for literature and prices.



* PAT APPL'D FOR

McINTIRE CONNECTOR CO.

Makers of DFN Dehydrators, Filters, Strainers

259 Jefferson St.

Newark 5, N. J.

ANSUL REFRIGERANTS • ENGINEERING

RESEARCH • FIELD SERVICE



ANSUL TECHNICAL SERVICE

• For more than 30 years the name ANSUL has been well known in the refrigeration industry... not only as a producer of high grade refrigerants... but, also, as a reliable source for authentic, up-to-the-minute technical information on refrigeration processes and problems-in-practice.

Thirty years of accumulated data, plus intensive and exhaustive research in ANSUL'S own research laboratories... covering many phases of refrigeration operations... have produced an Ansul library of technical data, unsurpassed in accuracy and scope.

ANSUL Technical Service is your "First Assistant"... the "Helping Hand" that reaches Refrigeration and Service Engineers everywhere... through ANSUL'S

world-wide wholesale organization. You are welcome to make full use of it any time without cost or obligation.

Take your problems to your wholesaler. He probably has the ANSUL technical bulletin which will answer your questions. If not, he will willingly get the information for you. He, too, wants to help make your job easier and more profitable.



ANSUL WHOLESALERS are ready and equipped to render an intelligent, co-operative service to refrigeration and service engineers on problems which arise from time-to-time in the operation of refrigerating systems.



ANSUL REFRIGERANTS ARE AVAILABLE AT LEADING WHOLESALERS EVERYWHERE

ANSUL CHEMICAL COMPANY

REFRIGERATION DIVISION, MARINETTE, WISCONSIN

DISTRIBUTORS FOR KINETIC'S "FREON-11," "FREON-12," "FREON-21," "FREON-22" AND "FREON-113"

instead of \$400, or a tax saving of \$257, because his real net income has been decreased by \$1285. Instead of having the illusion of a \$5,000 income calling for \$400 income tax, he has now a real income—and he had only that income in any case—of \$3,715 subject to a tax of \$143, leaving him with a net after taxes of \$3,572, certainly an improvement over the real income of \$3,315 after taxes if he had paid on an illusory \$5,000 income.

Certain warnings must be sounded. Figures in the above table of addi-

tional expenses are used only for explanatory purposes. Depreciation of certain equipment and fixtures may be at the rate of 5% a year or 20%, depending upon their nature. Obviously, equipment bought second-hand will have a shorter life than the same equipment purchased new. A passenger car may be used only slightly for business purposes or as much as 100%. (Incidentally, while not shown above, to the extent such a car is used for business purposes, all other expenses in addition to depreciation may be taken as a business

expense.) Use of half of a building would not necessarily justify a 50% deduction for utilities, though on the other hand business use of utilities might be much greater than home use. These are matters for the individual taxpayer to determine in the light of the facts applicable to his particular business set-up and experience.

Also, failure to take any of these items in past income tax returns does NOT make it permissible to include past overlooked items in a current return, i.e.: two years depreciation on a truck, for instance, in a 1946 return because of failure to show it in a 1945 return would be disallowed. Depreciation may only be taken for the year reported, regardless of whether it has previously been taken or not.

Nor may a depreciation schedule previously adopted be changed without Treasury permission merely to suit the tax purposes of the taxpayer. Generally, a depreciation schedule, once elected, must be adhered to throughout the life of the asset being depreciated. Neither may a taxpayer write-off in one year equipment, etc., which has a life extending over more than a year.

A check-list of other deductible business expenses apt to be overlooked by the harassed taxpayer includes:

Membership fees in business associations, including chamber of commerce;

Expenses, including travel, hotel and meals, attending trade conventions;

Bad debts, so determined and written off in year deducted only, but not including bad debts for merchandise or services if the taxpayer reports on the cash basis and has not previously or in current return reported such bad debts as income;

Loss from theft, either cash or property, either business or personal, but only to extent not covered by insurance;

Loss from accident, storm, hurricane, fire, flood, etc., either to business or other property, to extent not covered by insurance;

Subscriptions to business and trade magazines;

Cost of smocks or jackets (but not regular clothes used for work) if not adapted to ordinary wear; also laundering same.

WHAT THE DAVISON "D" MEANS



IN THE REFRIGERATION FIELD

"Look for the Can with the Blue Label"

It's natural to answer, "DRYNESS." Most service engineers recognize it as the symbol of "DEPENDABILITY."

But actually, it stands for the integrity of the Davison name. A name which appears on the familiar blue label . . . the standard drying agent . . . DAVISON REFRIGERATION GRADE SILICA GEL. Ask your jobber for it in bulk or in factory-charged dehydrator cartridges!

THE DAVISON CHEMICAL CORPORATION

Progress through Chemistry

BALTIMORE-3, MD.

Canadian exclusive sales agents for DAVISON SILICA GEL:

CANADIAN INDUSTRIES LIMITED, General Chemicals Division



**In Detroit--
In Every
Modern City.**

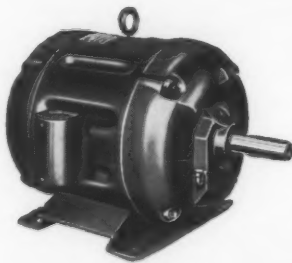
WAGNER *Quality* **MOTORS**

**provide quiet, troublefree power for Heating, Ventilating
and Air Conditioning Equipment**

Cool and comfortable in summer... Warm and delightful in winter—Americans are becoming accustomed to conditions that make work and play more agreeable. Not only in large cities, but in villages too, air conditioning is a part of everyday life.

Heating, ventilating, and air conditioning has become a tremendous industry and Wagner engineers have played an important part in its development. Today, hundreds of thousands of Wagner Quality Motors are providing dependable, quiet, troublefree power. Users of Wagner motors also profit by our quick, convenient, nationwide service facilities.

Twenty-nine branch offices, located in principal cities are ready to give you service. They can help you solve all of your motor problems. Write for Bulletin MU-185, addressing Wagner Electric Corporation, 6442 Plymouth Avenue, St. Louis 14, Mo.



Regardless of what your motor requirements may be—large motors... small motors... Wagner makes them all. The motor illustrated is typical of the Wagner line of polyphase and single phase motors. Choose a Wagner motor for your next installation.

Wagner
Electric Corporation
EST. 1891

Consult Wagner Engineers on all Electric Motor Problems



BRIDGE BRAKES • POWER AND DISTRIBUTION TRANSFORMERS • MOTORS • UNIT SUBSTATIONS
ELECTRICAL AND AUTOMOTIVE PRODUCTS

MA47-S

FEBRUARY, 1947

53

EXPANSION VALVES . . .

Continued from page 33

flooding liquid through to the suction line. However, with a further decrease in brine temperature, the refrigerant again floods back, as it is unable to pick up sufficient heat to completely vaporize it in the evaporator. Again the mechanic adjusts the valve to regulate at a lower pressure, say 20 PSI. And with further floodbacks or frostbacks and further adjustments, the curve of suction and

discharge pressures would be very much as shown in Figure 3.

The solid suction line represents suction pressure changes when the automatic expansion valve is set manually. The dotted line shows the suction pressure when adjusted continually by the power element of the thermostatic valve.

The effect of changing valve adjustment automatically as in the thermostatic expansion valve may have several advantages over using an automatic valve with no mechanic to reset it as required. One advantage

is a quicker pulldown of the brine or evaporator temperature. This is due to the fact that with a constant speed compressor the capacity of the condensing unit varies very nearly in direct ratio to the absolute suction pressure. At 30 PSI the absolute suction pressure is about three times that at 0 PSI and the rate of heat removal is proportionate.

Another advantage of thermostatic expansion valve action over automatic expansion valve action is that the valves can be used in multiple. If one evaporator is temporarily warmer than another in parallel with it, the temperature difference between the evaporator and the evaporating refrigerant is greatest in the highest temperature evaporator since the evaporation temperature is the same. This means that the evaporator re-

CLARK H. MINOR of New York City, retired President of the International General Electric Co., Inc., has been appointed an honorary Knight Grand Cross in the Order of the British Empire by King George VI., according to a telegram received from Sir Archibald Clark Kerr, Baron Inverchapel, British, Ambassador to the United States.

quiring the greatest amount of refrigeration gets it, and if external conditions were equal and the valve were adjusted the same, both evaporators would attain the same temperature.

Of the five general types of pressure reducing devices, only two are inherently suitable for multiple evaporator action and require no auxiliary valves or controls for such operation. Low side floats and thermostatic expansion valves are the two inherently adaptable to multiple operation. Low side floats necessarily require an evaporator with an appreciable quantity of refrigerant in the evaporator to operate the float valve. Low side floats in general, for small refrigerators, require from 2 to 5 lbs. of refrigerant per evaporator so that if 20 evaporators were to be used in one system, 50 to 120 lbs. of refrigerant would be required in the system. On the other hand, a 20-evaporator system using thermostatic expansion valves might require only 10 lbs. of refrigerant in the system as the continuous tube evaporator used with the thermostatic valves would probably contain less than 1/4 lb. of refrigerant each.

(Part 2 will appear next month)

NEW



COLDSPOT CHICAGO SEAL

ASK YOUR WHOLESALER
FOR THIS IMPROVED CHICAGO
COLDSPOT REPLACEMENT SEAL



YOUR WHOLESALER
HAS A COMPLETE LINE OF
CHICAGO REPLACEMENT
SEALS AND VALVE PLATES



For better
performance
use
CHICAGO SEALS
and
VALVE PLATES

CHICAGO SEAL CO. 20 N. WACKER DR., CHICAGO 6, ILL.



Ralph Tucker checks over his file of service contracts with the aid of his pretty secretary, Jeanne St. John.

JUDICIOUS use of maintenance contracts can do a lot to help any commercial refrigeration or air conditioning service firm build a solid, continuing backlog of business . . . but woe to the man who signs such agreements indiscriminately with any customer and covering any equipment.

That is the cautiously qualified comment of Ralph E. Tucker, who with his son, James, operates the refrigeration service firm of Tucker & Tucker in Toledo, Ohio.

This company handles commercial, industrial, and domestic service, specializing in service to hotels, cafes, institutions, stores, and apartments. About 15 to 20% of its business in these fields falls into the category of contract service work, covered by regularly renewed preventive maintenance agreements.

But the guiding principle of Tucker's contract service work is that each job which is undertaken on this basis is considered separately, both as to the individual characteristics of the customer and the type and condition of his equipment.

Only after a considered judgment has been reached on the basis of these two factors is any service contract written.

These individual discrepancies in customers and equipment are of the

Maintenance

MADE TO MEASURE

A Toledo, Ohio, service firm operates on the principle that careful appraisal and selection of customers is the key to a sound and successful contract service business

utmost importance, Mr. Tucker feels, if contract servicing is to become a paying proposition for the average service firm. For instance, Mr. Tucker tries to avoid entering into maintenance agreements with any customers of the type which, simply because they were paying for service on a flat rate basis, would be calling up every other day and demanding attention to some trivial and unimportant detail. He also declines to write contract agreements covering

file under the date when the next regular inspection is due. Any time an emergency call is made on equipment serviced on a contract basis, this card file is checked to see when the next regular inspection of that equipment is due. If this date is not too far in the future, the serviceman then performs the routine check at the same time that he makes the emergency repair, and the contract card is then refilled under the next inspection date.

This system prevents a needless and wasteful duplication of effort, Mr. Tucker points out.

The contract which the Tucker firm employs is a simple typewritten agreement, following the form outlined below, which clearly sets forth the liabilities and obligations of both parties.

Here is how the contract is worded:

"Agreement entered into between Tucker & Tucker and
 effective this
 day of 1946.

"In consideration of
 dollars, Tucker & Tucker, 846 Western Ave., Toledo, Ohio, Main 3633, agrees to furnish all labor on the following equipment:

.
 for a period of

"Tucker & Tucker also agrees to give a 25% discount on any materials used for maintenance of same equipment and to repair any parts possible. Tucker & Tucker also agrees to give them preference to customers of uncontracted calls.

"The management of agrees that they will not themselves attempt to service this equipment or use another service man.

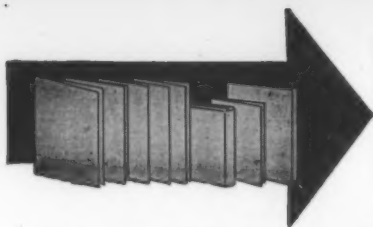
"This agreement entered into not subject to fire, theft, or malicious damage of equipment or acts of God or law and/or war."



equipment which is in such poor condition that it will necessitate overly frequent repair calls.

Either of these two conditions, he points out, can result in tying up a service company's personnel, monopolizing its time, and making contract servicing an all-headache, no-profit proposition.

Each contract is listed in a card



Useful Literature

The publications listed below are available to readers without charge. Simply list on the postcard provided in this issue the numbers of the items you wish to receive, and send it to **THE REFRIGERATION INDUSTRY**, 1240 Ontario Street, Cleveland 13, Ohio. Your requests will then be forwarded directly to the companies concerned.

113—Engine Brochure . . . A new 8-page brochure describing the new 2-cycle Series 1200 die-cast industrial gasoline engines manufactured by McCulloch Motors Corp. Gives details on standard motors now in production and information on special engines which company is prepared to mass-produce for various applications.

114—Industrial Thermometer . . . Information on new "Senior Midget" separable socket industrial thermometer offered by Accuracy Scientific Instrument Co. New instrument allows a new refill stem to be inserted instead of returning thermometer to factory for repairs. Bulletin 55.

115—Display Cases . . . Two bulletins, one describing the double-duty display case and the other the add-a-section top display case manufactured by Federal

Refrigerator Mfg. Co. Shows front and rear views, lists key specifications.

116—Home Freezer . . . A folder illustrating and describing the Neepco "Cold Cache" home and farm freezer, a 2-compartment freezing and storage unit of 17 cu. ft. total capacity, manufactured by Nelson-Peiss Mfg. Co. Lists construction and design features.

117—Germicidal Equipment . . . A 4-page folder issued by Barr Industries describing the Refrigeration Unit No. M8515 which it is producing for use in meat storage cases and coolers. Lists equipment advantages, gives installation and mounting data.

118—Welding Data . . . A 32-page booklet issued by All-State Welding Alloys Co. telling of savings resulting from low-temperature welding, and listing products

in the All-State line.

119—Multi-Outlet Valve . . . A bulletin (No. 180) available from Alco Valve Co. describing operating characteristics and listing applications and other information on its multi-outlet thermo valve.

120—V-Belts . . . A catalog (No. 44) available from Dayton Rubber Mfg. Co. on its line of V-belts for replacement purposes.

121—Insulation . . . A bulletin on "Fireproof Refrigeration Construction" telling about a new method of insulation construction built around Gold Bond Zero-cell. Available from Industrial Division, National Gypsum Co.

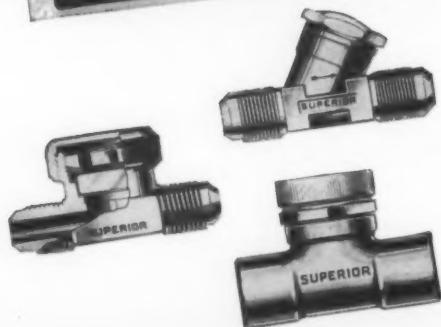
122—Commercial Controls . . . A bulletin (No. 1042) available from Ranco, Inc., describing its recently-announced Type "O" commercial controls for temperature or pressure control applications.

123—Charging Hose . . . Information on its new flexible refrigeration charging hose, sold only through refrigeration supply houses. Available from American Brass Co., American Metal Hose Branch.

124—Solenoid Valve . . . A bulletin (RS110) available from Automatic Products Co. giving details on that company's new Model 73RJ solenoid valve.

NOW IT'S HOTPOINT, INC.

Directors of Edison General Electric Appliance Co., Inc., have voted to change the official name of the company to Hotpoint, Inc.



No. 128

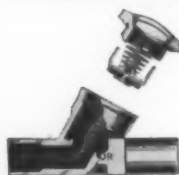
SUPERIOR VALVE & FITTINGS COMPANY
PITTSBURGH 26, PENNSYLVANIA

OFFICES IN PRINCIPAL CITIES • STOCKS: CHICAGO (6) • LOS ANGELES (15) • JOBBERS EVERYWHERE

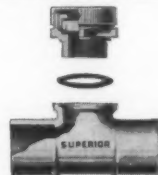
SUPERIOR CHECK VALVES—unique design, positive acting, spring-operated—cannot chatter, hum or buzz under any normal operating conditions. Pressure drop is negligible. Install one in the suction line of each low temperature circuit of all low temperature jobs—your assurance of maximum performance and trouble-free operation.

SUPERIOR LIQUID INDICATORS—call them liquid indicators, sight glasses, or refrigerant shortage detectors—one should be installed in the liquid line of each system. Seal cap over sight glass is double assurance against damage and leaks.

Note these exclusive features



The novel design of these SUPERIOR Check Valves permits the easy removal of all internal parts—as a unit—while soldering lines to valve connections, or for subsequent inspection.



Entire upper assembly of SUPERIOR Liquid Indicators—in all sweat sizes—may be removed as a unit to preclude damage by heat while soldering lines to body connections.

If you haven't a copy of Catalog R2, request one today



Round Pegs for Round Holes

Standing back of every refrigeration part manufactured by Kelvinator is the same experience . . . the same high quality materials . . . the same precision equipment . . . and the same skilled and experienced operators that have established an outstanding reputation for *quality* in refrigeration products.

Be sure you get the part made for the job by ordering *genuine* Kelvinator manufactured refrigeration parts. Quickly available from your nearest Kelvinator parts depot.

DIVISION OF NASH-KELVINATOR CORP.
Detroit, Michigan

Kelvinator



CONDENSING UNITS OPEN AND SEALED

BALSA WOOD INSULATION PANELS

for
**COLD STORAGE,
LOW TEMPERATURE
CONSTRUCTION**

BALSA WOOD—a natural insulating agent (92% dead air cells)—is available in volume for **IMMEDIATE DELIVERIES**.

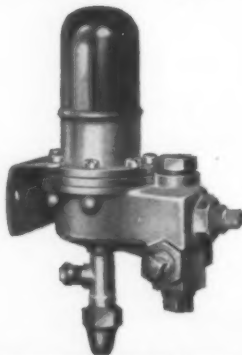
- Low K factor
- Standard Installation Specifications
- Standard corkboard panel sizes
- Easily waterproofed
- Kiln dried—sanitary and odorless
- Average density 9.24 lbs. per cubic foot
- Unusual structural strength in relation to its weight

Write for Full Information

**BALSA ECUADOR
LUMBER CORPORATION**

500 Fifth Avenue New York 18, N. Y.

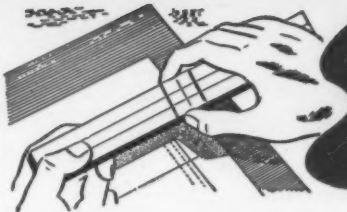
AMINCO Snap Action Valves For Multiple Temperature



Used with systems having more than one coil, operates from same compressor. . . . Adjustable from 20" of vacuum to 63 lbs. pressure. . . . Differential 7 lbs. min. to 29 lbs. max. . . . Free from bellows strain. . . . Used with any refrigerant except ammonia. . . . For flooded as well as dry gas types or any combination. . . . A proven performer.

AMERICAN INJECTOR CO.

1401 - 14th AVE. DETROIT 18, MICH.
Van D. Clothier, 1015 E. 10th, Los Angeles
G. I. Boone, Rm. 739, 1775 Broadway, N. Y.
J. C. Battles, 504 Bond Bldg., Galveston, Ill.
W. H. Oddy, Santa Fe Bldg., Dallas, Texas
Expert: Borg-Warner, 310 So. Mich., Chicago



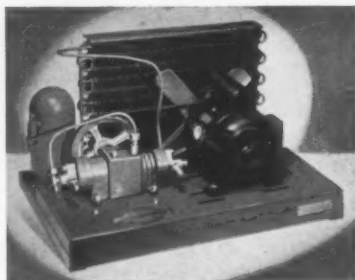
New
PRODUCTS

For further information on any of these products, simply list the key number at the head of each item on the special post card enclosed with this issue.

Condensing Unit P-19

Product: ½ hp. two-stage condensing unit.

Manufacturer: Controldtemp Corp., Brooklyn, N. Y.



Features: Unit is compact, said to be first time a two-stage unit has been available in so small a size. Adaptable for variety of applications including frozen food cabinets, reach-ins and display cases. Manufacturer says immediate delivery of units is being made.

Charging Hose P-20

Product: Flexible refrigerant charging hose.

Manufacturer: Electrimatic Div., Chicago, Ill.

Features: Special composition core, high strength and durability are designed to provide long service. Will stand much flexing and twisting without damaging usefulness. Available in 2 styles—standard, comprising hose and fittings, and combination, comprising hose and fittings with 6" copper tube extensions on each end. Both styles have ¼" O.D. flare swivel nut arrangement on each end, plus flare fitting plugs. Lengths from 24" to 60" in standard and 12" to 48" in combination style available.

Frozen Food Case P-21

Product: Self-service frosted food display case.

Manufacturer: Fogel Refrigerator Co., Philadelphia, Pa.

Features: Model 3900F is being made in 6 and 8 ft. lengths; 2 and 3 doors, depending on length. All welded-steel construction, fluorescent lighting, adjustable interior steel dividers. Rust proof steel interior, white enamel exterior. Transparent sliding doors may be removed if desired for open display. Six-foot case holds 525 packages, 8 ft. case 775 packages. Both models have oversize freezer plates front and rear. Illuminated superstructure is optional equipment.

"Bantam" Condenser . . . P-22

Product: "Bantam" model Aero-pass condenser.

Manufacturer: Niagara Blower Co., Buffalo, N. Y.

Features: Available for refrigeration systems from 2 to 7 tons. Operates under automatic control to maintain minimum practicable head pres-



sure at compressor in all seasons of year. Using spray water principle, refrigerant is condensed without material consumption of condenser water. Removes 1000 Btu from refrigerant for every pound of water evaporated. Condenser features Niagara Duo-pass pre-cooling coil to prevent scale deposit on coils; "Oil-out" between dry coil and sprayed

THE REFRIGERATION INDUSTRY

coils for removal of oil; "balanced wet-bulb control" for maintaining uniform head pressures.

Air Conditioner • • • • P-23

Product: "Ameri-Therm" air conditioners, 3 to 15 hp.

Manufacturer: American Thermal Industries, Inc., Detroit, Mich.



Features: Adaptable to both self-contained and remote installations, units have all component parts easily accessible for servicing. Can be used for winter air conditioning by optional installation of hot water or steam heating coils. Full filtering area claimed, with front and rear filters interchangeable. All moving parts isolated from frame for quiet operation. Return air is brought through motor compartment in lower section of conditioner and then passes through cooling coils; this feature is said to provide better cooling of compressor, motor and liquid receiver, and allow use of full-size filters. Eliminator plate below cooling coil handles condensate.

Temperature Alarm • • P-24

Product: "Freeze Warden" thermostatically controlled warning system for refrigeration units.

Manufacturer: Crescent Laboratories, Montclair, N. J.

Features: Unit is designed to protect foods stored in freezer in event of power or mechanical failure. Has its own source of power independent of house current. Housed in plastic case; may be located in any convenient place. Alarm sounds when temperature reaches pre-set temperature of 20 to 25 F. Retail price \$18.95.

Water Bubbler • • • • P-25

Product: Improved drinking fountain bubbler valve.

Manufacturer: Ebco Mfg. Co., Columbus, Ohio.

Features: New bubbler allows full stream of water at any height



without squirting or surging. Has self-closing valve and automatic stream control with lever handle for easy operation. Valve has all-brass body; is accessible for regulating bubbler stream to desired height, is said to be non-clogging.

For Appliances Up to 1000 lbs. —Very Easy Rolling!



WITH BIG
DUAL
WHEELS

\$31.95

This new dual wheel truck rolls easy as a baby buggy, and the man who operates it won't be nearly as tired at the end of the day. 8" rubber wheels give a firm base, make heavy objects easier to load, easier to roll, easier to handle.

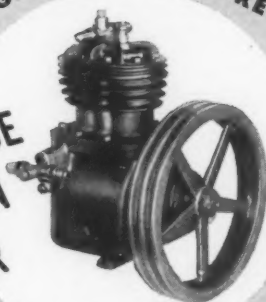
usually quiet and resilient. Tube steel frames. Ht. 54"; 24" nose. Over 10,000 Handee trucks sold by mail.

Try at our risk. Return express collect if it doesn't fit your needs. Order Monday—get Friday from

HANDEES COMPANY Dept. R1-2
Bloomington, Ill.

"ADVANCED" REFRIGERATION COMPRESSOR

THE ALL-PURPOSE REFRIGERATION COMPRESSOR



4A

For anything that a 1/2 HP refrigeration compressor can handle, the "ADVANCED" Model 100 is it!

Made in our own plant to our own design, right from the raw materials.

For specifications and other information, write or phone to address below, Dept. R-3

Model 100—1 3/4" x 1 1/2"—2 cyl., flywheel 10" diam., 2-groove "A" section—1/2 HP. For use only with Freon refrigerant.

**AVAILABLE
TO MANUFACTURERS
AND JOBBERS**

ADVANCED AIRCRAFT, INC.

Compressor Division
Cornwells Heights, Pennsylvania
Cornwells 0564

THE COMPRESSOR YOU CAN DEPEND ON

Welding Rods • • • • • P-26

Product: Two new nickel-silver welding rods.

Manufacturer: All-State Welding Alloys Co., White Plains, N. Y.

Features: One of rods is recommended for production and fabrication of light steel and nickel alloy sections and is suitable for low-temperature welding of steel, stainless steel, copper nickel and nickel; the other is recommended wherever resistance to frictional wear is desired or for work on worn or broken parts.

Air-Acetylene Tips • • • • • P-27

Product: An attachment for adapting any standard oxy-acetylene welding torch for body soldering, tinning, and light brazing with an acetylene-air flame.

Manufacturer: Acet-A-Tip Co., Chicago.

Features: Attached to torch tip by means of a base, fitted with a 2-inch length of two-ply hose. Hose is forced over welding tip. Precision-machined from solid brass bar stock, these units are available in three sizes.

Home Freezer • • • • • P-28

Product: 1947 "Marvel" home freezer unit.

Manufacturer: W. Allen Rogers

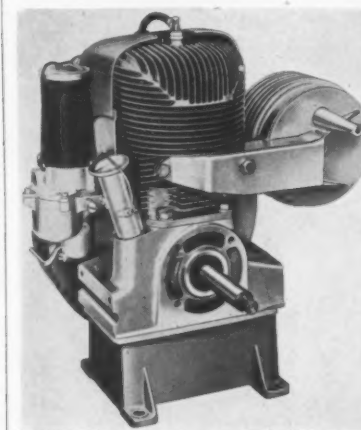


Industries, Demopolis, Ala.

Features: Powered by 1/4 hp heavy-duty unit; temperature controllable from minus 15 F to plus 3 F. Storage capacity, 12 cu. ft.; insulation, 5 inches on all sides. Cabinet is 72" long, 30" wide, 34" high, weighs about 750 lbs. Can be had in stainless steel throughout or stainless steel top with sides of either baked enamel or polished aluminum.

Light Weight Engine • • • P-29

Product: New line of light weight, 2-cylinder gasoline engines for mobile refrigeration and other applications.



Manufacturer: McCulloch Motors Corp., Los Angeles, Calif.

Features: Designated as Series 1200, four models now in production, ranging from 2 1/2 to 4 hp. Basic features claimed include light weight, superior starting and idling characteristics, compact size, adaptability to various applications, and simplicity of construction. Light weight is derived from wide use of

**Good for
the Last
Drop**

THAWZONE
PATENTED
The PIONEER FLUID DEHYDRANT

**.... of
MOISTURE!**

Thawzone is not only excellent for most cases of moisture in refrigeration systems, but, paraphrasing a famous slogan, it is good for that last drop of moisture which becomes sidetracked or "trapped".

Thawzone is a MOVING dehydrant. It circulates, searches out that "last drop", destroying it chemically wherever it finds it. Sold by refrigeration supply wholesalers in the United States and Canada.

A TINY AMOUNT → **A BIG JOB** ← SMALL COST

. . . and we haven't raised our prices!

HIGHSIDE CHEMICALS CO.

195 VERONA AVE.

NEWARK 4, N. J.

ALSO MAKERS OF

TRACE
REFRIGERANT
LEAK DETECTOR

aluminum alloy die castings wherever possible. Model 1200C develops 4 hp at 4000 rpm, weighs 24 lbs. This unit is said to have wide adaptability for power applications of almost all types. Model 1200E, basically same as 1200C, has no cooling fan and shroud, is particularly adaptable to refrigeration applications.

Attic Fan Timer • • • • P-30

Product: Model AF attic fan timer.

Manufacturer: Paragon Electric Co., Two Rivers, Wis.



Features: Two models available can be pre-set for any period to 10 or 20 hours, respectively, by 10 or 20 minute intervals. Timer opens fan circuit and turns off fan at end of pre-set period, allowing automatic operation over entire time range. Timer powered by Telechron self-starting synchronous motor; case finished in anodized aluminum. Dial and pointer protected by transparent plexiglass window. UL approved for 24 volt or 115 volt a.c. Clock motor runs only when timer is in operation.

Recording Device • • • • P-31

Product: Temperature recording device.

Manufacturer: Developed by Frozen Food Institute, Inc., and C. J. Tagliabue division of Portable Products Co.

Features: Cardograph recording device designed to record temperature fluctuations and so tell time and place where frozen foods permitted above accepted degree of temperature. Applicable in storage warehouse, transportation units, store display

cabinets, home storage cabinets. Made in five sizes to cover various applications; runs on 24-hour basis for 10-day period. Sealed instruments placed with shipment, copy of card record sent to shipper and FFI for checking.

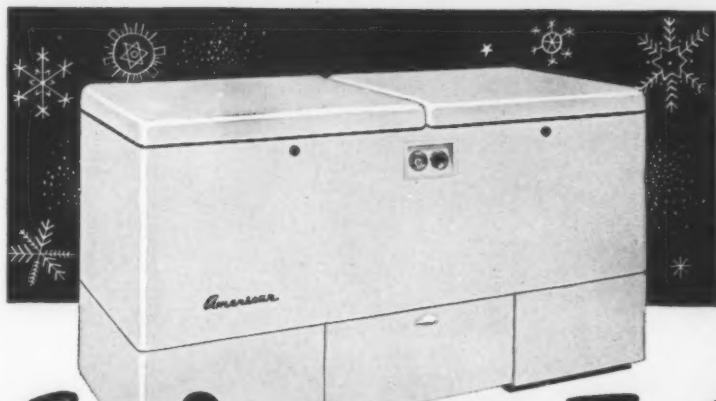
NORGE DISTRICT MEN ATTEND "SCHOOL"

Newly-named Norge district sales representatives recently completed a six-weeks' schooling period, with four weeks of training at the factory in Detroit followed by a two-week

tour of Norge plants in Muskegon and Muskegon Heights, Mich., and Effingham and Herrin, Ill.

New district men include: Robert M. Reed, Philadelphia; Edward L. Murtagh, Cambridge, Mass.; J. W. Webster, Royal Oak, Mich.; C. A. Marvin, Edwardsville, Kan.; J. H. Baine, Jr., Memphis, Tenn.; Frank H. Toler, Great Falls, Mont.; Charles H. Alden, Berkeley, Calif.

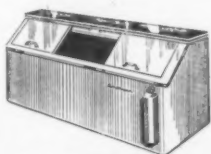
They will work with Norge regional managers and distributors in carrying product and other information to retailers.



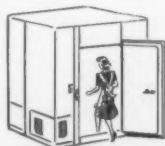
Sell AMERICAN First



Home, Farm and Commercial Freezers



Arid-Air Bottle Coolers



Extensional Walk-In Coolers

THE FREEZER WITH YEARS AHEAD FEATURES

FIRST—with an *all-aluminum* cabinet, inside and out . . . light, strong, rustproof!

FIRST—with automatic-opening top door . . . just touch the button! A great feature for housewives who have struggled with heavy doors.

FIRST—with convenient visual control panel, combining Quick-Freeze and Zero-Storage thermostat control, visual temperature indicator.

FIRST—with large packaging and storage bin, which lifts out for easy access to condenser unit.

See it . . . sell it! The greatest Freezer value on the market today is the new 1947 AMERICAN

DEALERS! Write for colorful illustrated literature on AMERICAN Quality Products.

AMERICAN

REFRIGERATOR & MACHINE, Inc.
2700 University Avenue, N. E., Minneapolis 13, Minn.

DEFROST SYSTEMS . . .

Continued from page 36

clock, providing defrost cycles at predetermined intervals.

One of the most common electrical defrost systems in use today consists of an electrical immersion heater in contact with the liquid refrigerant. Hot liquid refrigerant is fed through the coil during the defrosting cycle. A heat exchanger must be provided on this installation to vaporize liquid refrigerant returning through the suc-

tion line before it enters the compressor. A suction line throttling valve must also be provided to prevent motor overloading after the defrost cycle, when relative high pressures occur. This system requires considerably more than a normal refrigerant charge to assure an adequate quantity of liquid during the defrost cycle.

Most electrical defrost systems can be used on small installations and are rarely found applied to large systems because of the size of power wiring required for high amperage

heaters. Electrical defrost systems are relatively expensive to install because of the wiring cost. The electrical installation must consist of vapor-proof materials within the freezer area. Most heaters employed for this purpose have relatively short life. The danger from overheating and short circuits is always present. Electrical defrost systems usually increase the temperature of the cooling unit to a higher degree than other defrost systems, thus creating greater temperature fluctuations within a refrigerated area. Difficulty is sometimes experienced with this type of system in getting sufficient heat into defrost lines to carry off waste water.



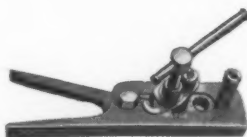
THE application of this definition to 'Superior' tubing is substantiated by the amount of orders (both filled and unfilled) at Penn Brass & Copper Co.

Making 'Superior' products is a tradition at Penn and from the size of the cheering section we find we have made a lot of new friends.

'Superior' is better for it is Dry, Clean & Bright, Seamless and Easy Bending.

Everyone at Penn has a flare for making a better tube -- this also is a fact. Write today for colorful circular entitled "After The Pressure Is Off."

PENN TUBING IS "SUPERIOR"



READY FOR
IMMEDIATE DELIVERY
PAPCO #400

The fast flaring tool that the entire industry is talking about. Send for latest bulletin.

AUTOMATIC HOT GAS DEFROST SYSTEMS with heat accumulators have been accepted widely in modern cold storage rooms. This system can be applied to both large and small installations. It consists of a standard hot gas defrost system with the addition of a storage device which accumulates a part of the heat which normally flows to the condenser. When defrosting occurs, some of the stored heat is added to the discharge gas to provide rapid defrosting, and part of the accumulated heat is used to vaporize the condensed liquid returning from the coil. This system also supplies heat to the drain lines and drain pans by attaching a hot gas line to them, thus preventing freezing at these points during the defrost cycle. This system is actuated by a timer which opens the solenoid valve in the hot gas line and stops the circulating fan during the defrosting cycle. Defrosting period is usually accomplished in 5 to 10 minutes, and the frequency of defrosting can be predetermined and the time adjusted to carry out this cycle. The condensing unit must be in constant operation during the defrost cycle. This is usually accomplished with a pressure control, but it is possible to interconnect the holding coil of the starter operating the refrigeration motor to the timing mechanism.

This system is a big improvement over the manual hot gas defrost system. It provides a means of easily removing the defrosting water from the refrigerated area. It can be applied in areas where water for defrosting purposes is not available, and once the system is properly balanced,

PENN

BRASS & COPPER CO.
ERIE, PENNSYLVANIA • Phone 35-111

requires very little attention. A hot gas defrost system, like the electric defrost system, carries considerable heat into the refrigerated area and is apt to give more temperature fluctuation within a refrigerated enclosure than some other types of systems.

The danger of refrigerant slugs through the suction line to the compressor is not entirely absent in this system. Also, considerable additional wiring and refrigerant piping are necessary to install this system, and the first cost on the equipment is higher than some competitive systems.

AUTOMATIC BRINE SPRAY SYSTEMS WITH BRINE CONCENTRATOR provide a defrosting system which encompasses all of the advantages of the previously-mentioned spray systems, together with several improvements. In this system the low temperature coil never accumulates frost as long as the specific gravity of the brine is maintained. A non-corrosive, odorless brine of the ethylene-glycol family is used. This brine is sprayed over the cooling coils, with a pump connected at the sump pan of the spray cooler. During the operation of the spray cooler, water condensed from the air fills the sump pan and dilutes the solution. When the level in the pan is raised

of the spray cooler. An aquastat is connected in series with the float switch so that either low liquid level or high temperature can cut off the heating elements.

For each specific gravity of the brine solution, there is a positive boiling point, and by adjusting the aquastat to a predetermined temperature, a brine solution of the proper specific gravity can be returned to the spray cooler. The cold brine from the refrigerated area passes through the heat exchanger, counter flow to the hot brine, leaving the con-

centrator performing two functions: preheating the cold brine before it enters the hot concentrator and pre-cooling the hot brine before it enters the spray cooler.

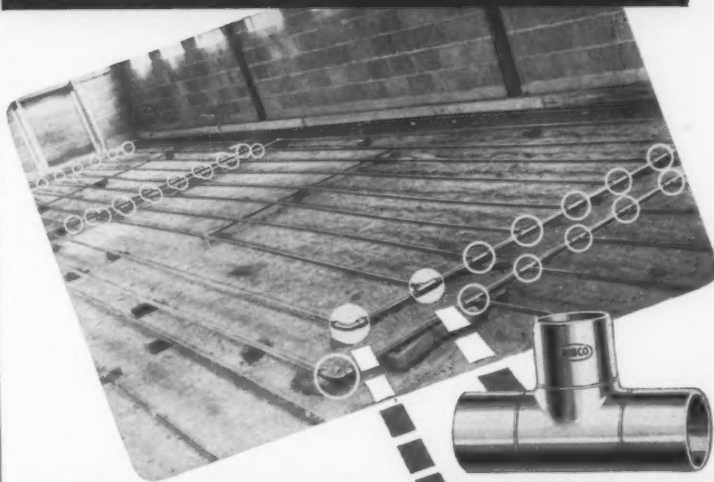
This type of system makes for high ice machine efficiency, due to close temperature differences between cooling coil and air, as no frosting occurs at the coil. It also is adaptable in areas where no drain piping is available within the cooler area. However, it is relatively expensive and is not so adaptable to small tonnage jobs. While it was designed as

THE new \$600,000 warehouse to be constructed by Grocerland Cooperative, Inc., in Chicago will be completely equipped with refrigeration facilities, and will house a frozen foods department and a restaurant department.

The restaurant department, a pioneering effort on the part of a cooperative, will undertake to supply restaurants in addition to its own grocer members.

to predetermined depth, a float switch actuates a solenoid valve, connected in a line on the pressure side of the sump, permitting the brine solution to flow to a concentrator or "still." In the concentrator the liquid level is raised and a float control in the kettle of the concentrator operates a magnetic switch, which turns on a heating element, which may be either electrical or steam. A certain part of this liquid is evaporated through the bubble columns of the concentrator to waste; the balance of the solution, at a higher concentration than the feed liquid, is returned to the sump

FOR RADIANT PANEL HEATING



NIBCO WROT Copper Fittings

IN THE MARION SCREW PRODUCTS COMPANY BUILDING
AT MARION • INDIANA

RADIANT HEATING installed in floors is ideal for factory buildings, but when heating pipes and fittings are embedded in concrete, they'd better be good! After the floor has been poured, they are not easy to reach. That's why Marion Screw Products Company chose copper pipe with NIBCO WROT Copper Fittings. The perfect solder joint between a WROT Fitting and copper tubing is permanent. If you are not familiar with NIBCO WROT Fittings, write today for Catalog 614.

NIBCO



NORTHERN INDIANA BRASS CO.
ELKHART, INDIANA
VALVES AND FITTINGS SINCE 1904



a fully automatic system, maintenance costs tend to be high and the system must receive regular inspection and adjustment. As the brine solution is sprayed through the circulating air in the cooler, it picks up particles of dust which collect at the orifices of valves, restricting the rate of flow of the brine solution. These valves must be cleaned and reset periodically. The heat exchange surface also requires regular inspection and cleaning, as these dust particles may cake on to the surfaces where high temperatures occur. The

same care must be given to the heating elements. Stoppages in brine circulating systems may cause the sump pan of the spray cooler to overflow. This is costly, as this non-corrosive brine is relatively expensive. This system provides even cooler temperatures, since defrosting is a continuous rather than a cycle operation.

AUTOMATIC WATER DEFROST SYSTEMS provide the least expensive defrosting systems, both from the standpoint of equipment and installation.

This system consists of the same material described in the hand-operated water defrost system, except that the hand valve is replaced by a magnetic valve, which is operated by a simple timer.

The defrost time switch comprises a telechron synchronous motor which continuously rotates a graduated split-cam at a speed of one complete cycle in 12 hours, when an electrical switch trips and shuts off the fan motor and compressor motor for a period adjustable from 7 to 12 minutes. At the same time these motors are cut off, another electrical circuit is energized for opening a magnetic valve in a cold water line leading to a spray head above the condensing coils. This valve may remain open for a period (selected on the time switch cam) or from 6 to 10 minutes, as required for defrosting the coils. The magnetic valve shuts off and a fixed delay of from 1 to 2 minutes permits excess water to drain off the coils into a drain pan, prior to starting the fan and compressor motors again.

A swing check should be provided in the supply water system between the magnetic valve and the spray header, to permit air to enter this piping after the defrost cycle to vent this line for complete draining. This system is very adaptable to most installations, and a timing arrangement of the defrost cycle can be varied to meet the particular application. In using cold water as a defrosting medium, very little heat is carried into the refrigerated area. The simplicity of the system provides very few points where failure could occur, and the number of refrigerant connections are the same as any standard high temperature installation. This is an advantage, as all joints are a potential source of refrigerant leaks.

In considering the advantages and disadvantages of the systems described, it can readily be seen that no one system is the answer for all jobs. Each must be applied where it fits best. In designing a defrost system, first select one that will give the desired results with the conditions that you must satisfy. Second, select one that will operate economically. And last, but not least important, select one that will have low maintenance cost.



Marsh Standard Pressure Gauge



Marsh Standard Compound Gauge



Marsh Gauge with Corresponding Temperature Scales



Marsh Ammonia Gauge



Marsh Remote Reading Dial Thermometer

MARSH Spells Lasting Accuracy

Every field has its leader, but few are the fields where a name is so synonymous with absolute dependability as is the name Marsh on a pressure gauge or dial thermometer.

Producing gauges and thermometers that *spell* lasting accuracy involves laboratory control reaching into every step of production . . . advanced methods of forming bourdon tubes and obtaining jewel-like accuracy in sectors, pinions, staffs and bearings . . . methods of gauging and checking of each component so that the final assembly must be right and *stay* right.

Ask FOR THIS NEW BOOKLET

The Marsh Gauges and Thermometers commonly used in refrigeration service are illustrated here and completely described in a new booklet which fully covers their construction and service range. Write for your copy.

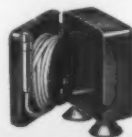


Now a Cold-box type of "SERVICEMAN"

Here is the popular Marsh "Service-man" with range increased for servicing quick-freeze units. It now goes down to -30°F. ; up to $+65^{\circ}\text{F.}$

Along with this, it has all the celebrated features of the original serviceman—lasting accuracy, remote reading, convenient self-contained form as illustrated. The Serviceman is also available in -10°F. to $+100^{\circ}\text{F.}$ temperature range.

JAS. P. MARSH CORPORATION
2055 Southport Ave., Chicago 14, Ill.



MARSH

Refrigeration Instruments

PRACTICE WHAT YOU PREACH . . .

Continued from page 43

Does doing a job like this work? Figure it out for yourself from these facts:

Branson Refrigeration Appliance Co.'s original building was 25 x 60 feet. It has since been extended to 110 feet.

Two hundred lockers were in the original storage plant. At this writing, this had been upped to 342. The plant includes, in addition, a 12 x 14 foot storage room for beef and bulk packages, and a cooling room 14 x 38 feet, any portion of which can be used for aging purposes.

Sharp freeze room has a blast coil system, with water defrost. A complete charge can be frozen every 8 hours.

Branson, Mo., and its surrounding area probably is the greatest per capita user of frozen foods in the U. S. No one thinks of entertaining or giving a dinner without consulting the frozen food list in Mr. Grif-fith's store.

More farm families own freezers and are regular users of frozen foods in this area than in almost any area you can name.

And it's all the result of Mr. Grif-fith's conviction that a refrigerator, in itself, is just a means to an end. Food processing, storage and conservation all are things you've got to sell, too.

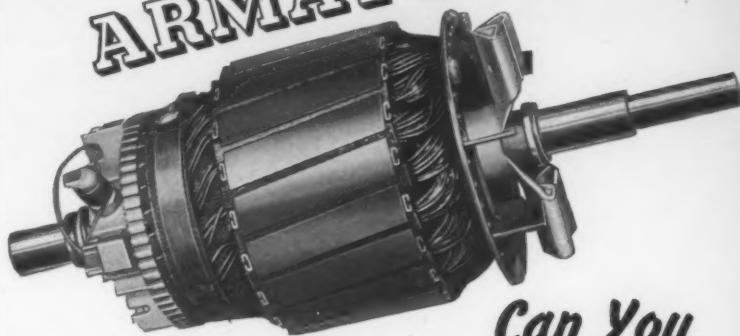
REFRIGERATED pre-cooling of celery is playing an important part in the operations of the Muskegon, Mich., branch of Robert L. Berner Co., shippers of celery. This company has just installed a device, the first of its kind in Michigan, that grades, washes, packs and pre-cools the celery.

"Our celery is more efficiently graded and handled than it has ever been before," says Ernest B. Decker, manager. "Our system of pre-cooling after packing enables us to get Western Michigan celery markets where it would never have been considered under the old method."

After being trimmed, graded, washed and packed according to accurate size, the celery is submerged for 12 to 18 minutes in the pre-cooling tank. The water in this tank is maintained at a temperature of 32 to 36 F.

From the pre-cooling tank the celery is placed in refrigerator cars for distribution. The plant's daily capacity is eight cars of celery.

Let's Talk About ARMATURES!



*Can You
Profitably Duplicate This
In The Field?*

All Wagner Armatures Have:

1. New core iron and windings.
2. New commutators properly undercut.
3. New shafts.
4. New centrifugal short circuiting devices.
5. New rocker arm and brush holder assemblies with brushes.

And Are:

6. Dynamically balanced.
7. Fully tested.
8. Ready to install.

Order Your New Wagner Armatures Today

Wagner motors are world-famous for dependable service. When repairing a Wagner motor, be sure to use genuine Wagner motor parts, designed and built to renew that dependability. Get them from one of the 325 authorized service stations displaying this sign.



Every motor repair shop needs this catalog. It helps you determine the catalog number and price of Wagner fast-moving motor parts. Write for Catalog MU-40 today.

M47-12

Wagner Electric Corporation

EST.  1891

6442 Plymouth Avenue • St. Louis 14, Mo., U.S.A.

New ATTIC FAN TIMER *by Paragon*



HERE'S a new member of the Paragon family... the AF Series for timing attic and window fans.

Entirely new in design, this timer is offered in two time ranges, 0-10 hours and 0-20 hours,

each fully adjustable to any position on the dial... a real convenience for the user.

Equipped with a quiet Telechron motor and an improved switch, the timer is rated for high capacity, and will handle a 1/2 HP motor. Beautifully finished drawn aluminum case, anodized, with dial and pointer protected by clear Plastacel.

Underwriter approved, all electric, no springs, mounts easily to Handy box or single gang switch box, or may be surface mounted with conduit connections into the bottom of the timer. The setting may be changed at will without harming the instrument. Timer motor runs only when timer is actually in operation.

Get your orders to your jobber—now and start planning installations early. Complete data sheet on request.

AT ONLY
\$9.75
AN
OUTSTANDING
VALUE

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TWO RIVERS, WISCONSIN

Paragon *Two Rivers*
WISCONSIN

MAKERS OF ELECTRICAL EQUIPMENT SINCE 1905

CONTRACTORS

News • Activities • Plans

While *The Refrigeration Industry* is not the official publication of the National Association of Refrigeration Contractors, the Editors assign this space each month to the association. The information below is furnished, for the most part, by the offices of the association and its local affiliates.

Groundwork is Laid for NARC-Union Dealings

A meeting was held Jan. 6-7 at the Statler Hotel, Washington, D. C., between the United Association of Journeymen and Apprentices of the Plumbing and Pipefitting Industry of the United States and Canada as representing the majority of the organized refrigeration mechanics, and the National Association of Refrigeration Contractors as representing the majority of organized refrigeration contractors, wherein the problems of mutual interest pertaining to the refrigeration industry were discussed. The result of this meeting was that the United Association recognizes the National Association of Refrigeration Contractors as a national association representing the refrigeration contractors.

It was agreed that the two associations will work closely together on all matters of mutual interest when legally possible which shall include the training of apprentices and journeymen employed in the refrigeration industry. Future meetings will be held by representatives of both organizations for the purpose of making a further study of conditions in the

industry in order to make recommendations that will create better labor relations.

Both the United Association and the NARC have agreed to utilize all of the various trade publications and other publicity mediums available to them to fully publicize and make known to all parties the result of these further studies and recommendations from time to time. Meetings of the committees representing both organizations are scheduled to be held early in the near future.

Present at the Jan. 6-7 meeting representing the United Association were: Martin P. Durkin, general president; Robert F. Lynch, labor relations committee member; John J. McCartin, general organizer; J. W. Harbaugh and C. F. Voss, special representatives.

National Association of Refrigeration Contractors was represented by Warren W. Farr, Cleveland, president; Ed S. Wright, Youngstown, first vice-president; Raymond J. Shock, Detroit, co-chairman, labor relations committee; Robert Weston, Pittsburgh, labor relations committee member and president of Refrigeration & Air Conditioning Association of Pittsburgh; Lee Quinn, Cincinnati, labor relations committee member and director of Refrigeration & Air Conditioning Contractors of Cincinnati.

FIVE MORE LOCAL GROUPS AFFILIATE WITH NARC

Recent addition of five local contractor associations has brought the number of such groups affiliated with National Association of Refrigeration Contractors to 18, a recent report by NARC's Cleveland headquarters states. The new NARC affiliates, and their officers, are:

Refrigeration Contractors Association of Cleveland—Fred Ramsey, president; George Schuld, vice-president; H. L. Smith, secretary; Paul Decker, treasurer. The association has a present membership of 20 firms.

Commercial Refrigeration Associa-

tion of San Diego (Calif.)—E. S. Bailey, president; Ralph French, vice-president; J. H. Gustafson, secretary; W. J. Fickler, treasurer. Robert O. Zumwalt has been employed as executive secretary for the group, which has 21 members.

Refrigeration Contractors Association of Northwestern Ohio—With 10 members and headquarters in Toledo, this group has as officers Paul Sizer, president; Jack Hattner, vice-president; R. M. Teall, secretary-treasurer; Fred Rudolph, sergeant-at-arms; M. E. Runge, executive secretary.

Mahoning Valley Refrigeration

THE REFRIGERATION INDUSTRY

Contractors Association—Youngstown, Ohio, is headquarters, and officers are Carl Dieter, president; Milford Remaley, vice-president; C. M. Campbell, secretary-treasurer; W. Harold Yost, executive vice-president.

Refrigeration & Air Conditioning Association of Pittsburgh—This organization has 14 members, and the following officers: Robert B. Weston, president; H. A. Alexander, vice-president; W. D. Armour, secretary-treasurer.

With the addition of these local groups, membership in NARC now stands at 850 firms and individuals in 38 states, District of Columbia, and Panama Canal Zone.

CITES LEGAL AIDS AS BAR TO PRICE-CUTTING

Under present conditions legal means can be used to halt price-cutting when other means fail, Harry Gottesfeld, attorney for Valley Equipment Co., Lodi, Calif., told members of the Refrigeration Contractors Association of Northern California at a recent meeting in San Francisco.

The attorney warned that after past wars there has been a tendency on the part of big corporations to attempt to monopolize trade by fair means or otherwise, with the object of driving out the small business man and consolidating the market. Today, he said, federal laws may be invoked to protect the little fellow and 45 states have unfair trade practice acts.

"If price cutting starts," he advised, "appeal to the manufacturers, wholesalers and jobbers to warn the offending companies. If this fails, legal action may result in injunctive relief."

NARC ISSUES GUIDE FOR LOCAL GROUPS

As an aid in the formation of local associations of refrigeration contractors, the National Association of Refrigeration Contractors has issued a six-page guide listing, among other things, why the NARC believes local associations will help contractors, and telling in detail how to go about setting up such organizations. Suggestions as to form letters and cards for use in calling the first meeting also are included in the guide. Interested contractors can secure a copy by writing to National Association of Refrigeration Contractors, 353 Hipp Annex Building, Cleveland 15, Ohio.

N.Y. GUILD ADOPTS CODE OF PRACTICES

Membership of the Refrigeration & Air Conditioning Guild, Inc., New York City, recently approved by unanimous vote a code of ethics and rules of business procedure covering price cutting, interference with present customers, customer complaints, and signed orders. Text of the code follows:

CODE OF ETHICS AND RULES OF BUSINESS PROCEDURE

I. The members of the Refrigeration & Air Conditioning Guild, Inc., have adopted the following rules for ethical business dealings as a general guide,

not, however, denying existence of other rules not specifically mentioned.

Sec. 1. Establishment of fair competitive price practices to insure fair and legitimate profits, permitting the refrigeration contractor to complete his responsibilities to the consumer after the sale.

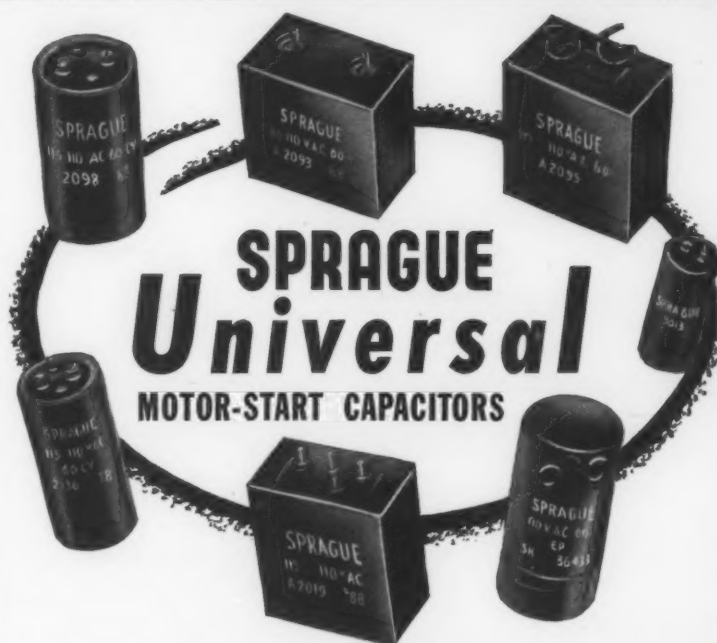
Sec. 2. To abstain from the practice of offering free service or cheaper than normal prices for service for the sole purpose of catching an unwary consumer and overcharging him in another item to make up for the free service.

Sec. 3. The consumer should not be made to pay more than the list price for refrigeration equipment or material plus the actual labor charge per man per hour, whether priced on a time and material basis or on a lump sum basis.

Sec. 4. The consumer is entitled to full protection in the carrying out of the refrigeration contractor's warranty and guaranty.

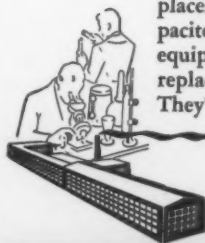
II. UNFAIR INTERFERENCE WITH PRESENT CUSTOMERS

Sec. 1. Efforts direct or indirect in



These few types handle EVERY REPLACEMENT JOB

You'll be away ahead of the game to use SPRAGUE universal types on EVERY motor-starting capacitor replacement job. Standard or permanent split-phase capacitor motor types available. A few universal units equip you for fast, accurate service on any capacitor replacement. They're small enough to fit anywhere. They're fully dependable electrically. Their cost is less than that of exact duplicate units. Write for Bulletin C-356 that gives you the entire story — tells exactly how to select the one to use on any given application.



SPRAGUE PRODUCTS COMPANY

North Adams, Mass.

any way to unfairly encroach upon the business of another refrigeration contractor are unworthy of a legitimate refrigeration contractor; but nevertheless, it is the right of any contractor to bid in on any job that was presented to him in the normal course of business.

Sec. 2. A refrigeration contractor should not ignore known customs or practices of the refrigeration industry, without giving his competitor fair and timely notice.

Sec. 3. A refrigeration contractor shall not knowingly or willfully by any means whatsoever interfere with any contract now in existence between contractor and customer, for the express purpose of appropriating the business of the contractor.

Sec. 4. The aspersion of the character of a competitor which questions his business integrity, his credit standing or the ability, quality or reliability of his services is condemned as an unfair trade practice.

Sec. 5. No refrigeration contractor

shall pirate an employee from another contractor. No refrigeration contractor shall hire an employee of another refrigeration contractor without first notifying the former employer that he is so hiring such employee.

III. CUSTOMER COMPLAINTS

Sec. 1. A refrigeration contractor, upon receiving a complaint from a customer that his competitor has violated any of the principles herein stated or is dissatisfied with the work performed by the competitor, shall personally contact his competitor to ascertain the truth or untruth of the customer's complaint. The refrigeration contractor shall not use the information received by the customer's complaint unless and until he has personally investigated and ascertained that such complaints are true.

IV. SIGNED ORDERS

All orders shall be in writing and signed by the customer except in spe-


cial instances. A refrigeration contractor shall not send a customer to a wholesale jobber or material supplier with an order on his own business card, but shall at all times send a signed written order for such material.

V. Every customer shall be given a written invoice and bill with labor, material and tax items separately stated and a guaranty if any agreed upon, shall be completely printed on such bill or invoice.


YORK NAMES 3 OUTLETS IN ST. LOUIS DISTRICT

Three new distributors of York refrigeration and air conditioning equipment have been appointed in the territory supervised by the St. Louis district office. The new outlets are:

Bastian Appliance Co., 123 S. Lincoln St., Centralia, Ill.; Kiesel's Co., 130 N. Santa Fe Ave., Salina, Kan.; and Stigall & Lindsey Refrigeration Service, 124 Broadway, Paducah, Ky.



6 out of 10 manufacturers of original equipment SPECIFY USG




UNITED STATES GAUGE

U.S. INSTRUMENTS Tell The Truth

Tomorrow's accuracy is here today in the new U.S. Supergauge. Get complete information about this superb instrument now.

DIVISION OF AMERICAN MACHINE AND METALS, INC., SELLERSVILLE, PA.
Manufacturers of Pressure, Temperature, Flow and Electrical Measuring Instruments




WEBER TEXAS OFFICE MOVED TO DALLAS

Texas district headquarters of Weber Showcase & Fixture Co., Inc., have been moved from Houston to 6475 Aberdeen, Dallas. Myrick E. Glenn is district manager, covering most of Texas and all of Oklahoma for Weber low temperature equipment, including ice cream and frosted food cabinets, home freezers, and low temperature walk-in coolers.

NEW ATLANTA OFFICE

The Kelvinator ice cream cabinet division of Nash-Kelvinator Corp. has opened a new office at 788 Spring St., N. W., Atlanta. Pat Hawkins is regional manager.

THE REFRIGERATION INDUSTRY

No matter how well you build
Your Product
...if its performance
depends on temperature
or pressure control...
that product
can be no better
than the controls
with which it
is equipped



WHITE-RODGERS ELECTRIC CO.

ST. LOUIS 6, MISSOURI

Controls for Refrigeration • Heating • Air Conditioning

USE OF PSYCHROMETRIC CHART TO DETERMINE AIR SUPPLY CONDITIONS: Fortunately, there is a simple way to determine all the possible temperature conditions for the supply air for any set of room design temperatures, once the room sensible heat ratio has been calculated. If the different values of dry- and wet-bulb temperature as determined by Formula 7a are

plotted on the psychrometric chart, it will be found that the points represented by these values lie on a straight line, which is known as the *ratio line*. The slope of the ratio line is determined solely by the room sensible heat ratio. It is also a characteristic of the ratio line that it always passes through the point on the chart representing room conditions. Therefore, if a scale is provided with the psychrometric chart to show the slopes of the ratio lines for the various room sensible heat ratios, it becomes a simple matter to rule a line

parallel to a specific ratio line through the point on the chart representing the room conditions, and thereby determine at once all the permissible combinations of dry- and wet-bulb temperature for the air supply. This will be illustrated in example to follow.

Different psychrometric charts provide varying methods for drawing ratio lines. The Carrier chart, for example, has a fixed scale and reference point in the lower right hand corner of the chart. Once the point representing room conditions has been located on this chart, a line is ruled through this point parallel to a line between the reference point and the particular sensible heat ratio involved. The Trane psychrometric chart, on the other hand, does not have a sensible heat ratio scale printed on the chart, but a transparent ruler containing ratio lines is supplied separate from the chart. By placing the reference arrow of the ruler at the point representing room conditions, and aligning the sensible heat ratio line (called sensible heat percentage line on the Trane Air Conditioning Ruler the sensible heat percentage being equal to the sensible heat ratio multiplied by 100 with a horizontal line through the room condition point, the ratio line will be indicated by the upper edge of the ruler.

For purposes of illustrating ratio lines, we shall use the Trane psychrometric chart first reproduced in Part II (August, 1946 issue). (A pad of Trane psychrometric charts together with the Trane air conditioning ruler and instructions for using same may be purchased for a small sum from the Trane Co., LaCrosse, Wis.) Figure 1 shows the Trane psychrometric chart with the ratio line drawn for the example discussed above, namely a .8 sensible heat ratio line (80 sensible heat percentage line) drawn through the point representing room conditions of 80 F DB—67 F WB.

All the points on this ratio line represent theoretically possible combinations of dry- and wet-bulb temperatures for an air supply which will maintain the desired condition of 80 F DB—67 F WB in the room. Some of these combinations as read from the chart are as follows: (1) 57 F DB—57 F WB; (2) 60 F DB—58.7

5620 glasses of highly carbonated water produced from single 20 lb. tank of CO₂ gas

...WITH THE NEW *Temprite* COOLER-CARBONATOR



- All stainless steel construction.
- Independent of city water pressure.
- Operates at 70 lb. CO₂ gas pressure.

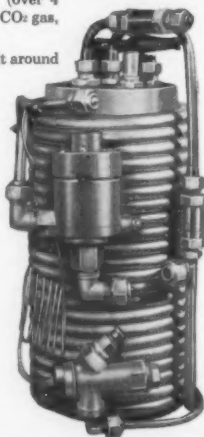
Latest Temprite development is the sensational *Combination Cooler-Carbonator* . . . which actually delivers over 5620 glasses of sparkling, highly carbonated water (over 4 volumes) from one 20-pound tank of CO₂ gas, at a constant 40° temperature.

The fact that the water cooler is built around and is an integral part of the carbonator itself, has not only resulted in an extremely compact, space-saving unit, ideal for all types of installations, but offers the user maximum carbonation at the lowest possible CO₂ gas pressure . . . without waste of CO₂ gas.

The new Temprite system, when connected to a 1/4 H.P. condensing unit, can dispense over 300 glasses of either plain or carbonated water per hour (or any proportion of each that may be required) reducing the temperature from 80° down to 40° F.

The Temprite cooler-carbonator package includes all necessary valves, checks and fittings, assembled to the carbonator, together with the motor, pump and relay assembly . . . ready for immediate installation.

Carbonator is available separately . . . wherever a satisfactory water cooling system is already in use.



1. Instantly cools plain water.
2. Instantly carbonates water at low temperatures.
3. Dispenses cooled plain or carbonated water.

TEMPRITE PRODUCTS CORP.

Originators of Instantaneous



Liquid Cooling Devices

45 PIQUETTE AVENUE

DETROIT 2, MICHIGAN

F WB; (3) 65 F DB—60.8 F WB;
(4) 70 F DB—63 F WB; (5) 75 F
DB—65 F WB.

Naturally, the volume of air to be supplied will be different for every set of supply temperature combinations. The lower the dry-bulb temperature, the less will be the volume of air required, with the minimum air volume occurring at saturation.

It should be noted that the ratio line discussed above intersects the 100% relative humidity curve, or saturation curve, at 57 F, indicating that the desired room conditions can be maintained by supplying the proper volume of saturated air at 57 F. All points representing lower supply air temperatures would lie off the chart. This calls attention to the fact that lower temperatures for the air supply are not feasible, thus corroborating our calculations in the preceding paragraph.

DETERMINATION OF AIR SUPPLY VOLUME: Once the temperature conditions of the supply air have been determined, the volume of air required may be calculated by the use of either Formula 5 or Formula 6, both giving the same result. By way of illustration, we shall calculate by both formulas the air volume required with supply air temperatures of 60 F DB—58.7 WB. Room design conditions, we recall, are 80 F DB—67 F WB, with a sensible heat load of 80,000 Btu per hour, and a latent heat load of 20,000 Btu per hour, giving a total heat load of 100,000 Btu per hour.

From Formula 5:

$$cfm = \frac{80,000}{20 \times 1.08} = 3700$$

From Formula 6:

$$cfm = \frac{100,000}{(31.54 - 25.54) \times 4.5}$$

$$cfm = \frac{100,000}{6 \times 4.5} = 3700$$

It is evident that the calculation by Formula 5 is the simpler of the two, and this method should be used whenever possible.

The supply air volumes for all the permissible supply air temperature listed in the preceding paragraph as calculated by Formula 5 are:

- (1) 57 F DB—57 F WB—3220 cfm
(2) 60 F DB—58.7 F WB—3,700 cfm
(3) 65 F DB—60.8 F WB—4,920 cfm
(4) 70 F DB—63 F WB—7,400 cfm
(5) 75 F DB—65 F WB—14,800 cfm

- (3) 65 F DB—60.8 F WB—4,920 cfm
(4) 70 F DB—63 F WB—7,400 cfm
(5) 75 F DB—65 F WB—14,800 cfm

It thus becomes apparent that as the temperatures of the air supply increase, the volume of air required to maintain desired room conditions also increases. Inasmuch as the size and cost of air handling equipment increases as the volume of air handled increases, it is desirable to

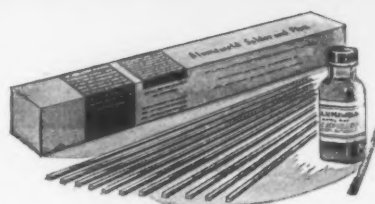
choose an air supply point as near the saturation curve as is possible.

There are other factors, however, which influence the selection of the supply air temperatures, and these will be discussed in detail in the next article.

NEW FIRM NAME

Household Appliances, Inc., has changed its name to Leonard's, Inc., 318 N. Centre St., Cumberland, Md. The company handles York commercial refrigeration equipment.

TO SIMPLIFY DIFFICULT SOLDERING JOBS USE ALUMAWELD & LLOYD'S PRODUCTS



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Alumaweld Solder and Flux

Ideal for installation and repair work. Joining copper tubing or fittings, repairing an aluminum part or soldering some stubborn stainless steel, one solder and one flux will do every job. High tensile strength, yet free flowing at 550F., this all metal solder and flux is used for "tough" jobs or for superior joints.

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STAINLESS STEEL FLUX

For fast, positive fluxing action on stainless and chrome alloy steels. No splattering, no creeping, no irritating fumes.

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A non-acid general purpose flux for use with all soft solders, especially low tin-content.

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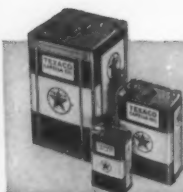
It's profitable to sell and use Texaco Capella Oils. Their ability to assure dependable operation has been proved in all types of compressors . . . and their high quality performance safeguards your reputation for reliability and brings you, *extra* sales and profits.

Texaco Capella Oils have every desired quality. They are stable, moisture-free, and non-reactive with refrigerants . . . have very low pour tests and resist gumming and sludging. Containers are *re-sealable* to

enable you to keep unused oil in proper condition.

You can get *Texaco Capella Oils* in convenient 1-qt., 1-gal. and 5-gal. containers . . . in every needed viscosity. All have the O.K. of leading compressor manufacturers.

Order *Texaco Capella Oils* for prompt delivery from your regular jobber or dealer. For information, call the nearest of the more than 2300 Texaco distributing plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.



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FOR ALL AIR CONDITIONING AND REFRIGERATING EQUIPMENT



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Humid-Temp Forced Convection Units
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The Watchdog of the Nation's Food Supply

LARKIN COILS
519 Memorial Dr., S.E.
ATLANTA, GA.

THE PRACTICAL Refrigeration Engineering MANUAL ... by Harold Smith

XV. Storing and Dispensing Beverages

PART III

IF THE beer warms up to 50 F. or higher, the gases expand within the barrel, agitate the beer, and make it "wild," which, in turn, creates a problem in properly controlling and providing a uniform glass of beer for the customer. If provisions are made to pre-cool the beer and the instantaneous coolers are used only for the final cooling at the bar, very satisfactory results are possible with this method of cooling.

The manufacturers of the instantaneous units rate their coolers based on b.t.u. load capacity, which enables the engineer to quickly select the proper unit for the job after he has determined the volume of beer to be passed through the cooler during peak-hour periods.

DIRECT-DRAW UNIT

Another popular type of draft beer equipment is made up as a complete unit, and is known as a direct-draw beer cooler. This type of unit has been used very extensively in the small business place.

This unit consists of an insulated box with a top made similar to a bar top, and with draft arms extending out of the box and directly connected to tap rods. One or two barrels are placed inside the cooler and tapped from above.

Air pressure or CO-2 is usually needed with this type unit to circulate the beer through the tap rod and draft arm for service. The cooling is done in the barrel compartment, with either a wall-type fin coil or forced-air condensing unit, usually built into the box by the manufacturer as part of the standard equipment.

The condensing units are sometimes built into the unit and supplied by the manufacturer but

usually they are supplied as a separate item and installed on the job. These self-contained type units are used extensively for temporary service where they are moved from one location to another for special occasions. The use of this type unit is confined largely to small or temporary applications.

BOTTLED BEVERAGE COOLERS

Nearly everyone working in the refrigeration industry is familiar with bottled beverage coolers. These coolers, usually constructed along chest lines, are completely self-contained and hooked up by the manufacturer, requiring only a plug in for service after shipping bolts are removed and service valves have been opened.

No engineering usually is required, unless the cooler happens to be a remote type or is installed in multiple with a complete cooling system.

There are two general types of bottle beverage coolers in common use, the dry type and the wet type. In the last few years, nearly all such coolers have been the dry type.

DRY-TYPE UNITS

The dry type cooler, in some instances, is not as efficient as the wet or water bath type, but is much better to work with, presents fewer service problems and provides a cooled bottle beverage more generally satisfactory for handling by the customer.

Dry coolers are usually lined with wall coils or plate coils running on the bottom of the cooler and the side walls; or, on some designs, the plates or coils are used as partitions within the cabinet, providing considerable surface area for cooling by direct

INCREASED APPLICATION OF POLYSTYRENE SEEN

Use of more than 8 million pounds of polystyrene plastic in household refrigerator units during 1947 is predicted by A. C. Martinelli, sales manager for thermoplastic molding materials at Monsanto Chemical Co.'s Plastics Division, Springfield, Mass. This prediction is based on the extensive use of this material in the household cabinet field last year.

Initial uses of polystyrene in this

field were pioneered by Monsanto in 1939, and today its applications include lamp shields for interior lights, control panels, knobs, doors for ice cube compartments, door handles, shelf supports, drip trays, bezels, and escutcheons.

INCREASES STOCK

The Nacona Frozen Food Lockers Co. of Nacona, Tex., has increased its capital stock from \$20,000 to \$30,000.

contact with the bottles.

The dry coolers usually provide more storage capacity, and the bottles are dry, giving them a better appearance and keeping the bottle labels intact and attached to the bottle when served. With water-bath type coolers, on the other hand, the bottles are wet when taken from the cooler, and must be dried before being delivered to the customer.

LABELS WASH OFF

The water bath also soaks the label loose, making it difficult to distinguish definite brands or flavors, and tending to lower the sales appeal in the eyes of the consumer.

Bottled beverage coolers are usually placed behind or near the bar or service counter for fast handling. Usually, the coolers are stocked once a day, and the cooling continues until the product is lowered in temperature to the desired degree.

Usually the coolers are completely engineered by the manufacturer, and are delivered for use with equipment of the proper capacity completely installed. Bottled beverage coolers used for soft drinks and milk are practically the same in type as those used for bottled beer.

VENDING MACHINES

The vending machine for dispensing cooled bottle beverages is becoming more commonly used each year. Here again, the unit is usually completely self-contained and all equipment is connected up by the manufacturer before the machine leaves the factory.

Soda fountains are also usually equipped with specially designed evaporators to fit the space provided in the fountain. While most fountains are not self-contained, with condensing unit installed, the capacity required is indicated by the manufacturer, so no special engineering is us-

ually required to determine the proper size of condensing unit to employ.

SODA FOUNTAINS

The modern, complete soda fountain is a somewhat complicated installation, particularly from the standpoint of adjustments. The larger units have numerous storage compartments, each designed for storage of a specific product with different temperature requirements.

To illustrate this fact, a fountain may contain either a dry or a wet bath storage compartment for storing milk, fruit juices, butter, other dairy products, sandwich meats, etc. These compartments are usually designed to be held at a temperature around 46 F. Usually two water coils are contained in the fountain, one coil carrying sweet water for drinking purposes and another coil carrying carbonated water, used in making soda and carbonated drinks. The water in these coils should be discharged from the taps on the fountain at temperatures ranging from 40 to 45 F. The different syrups used with sodas and sundaes also are refrigerated for best results. Here again is need for temperatures in the range of from 40 to 50 F.

Usually a large part of the storage space in a soda fountain is designed for storage of ice cream, both the packages in pint and quart paper pails and bulk 2½ or 5 gal tin cans. The temperatures required for proper storage of ice cream usually are from minus 5 to plus 5 F.

Because of the varied storage temperatures needed for soda fountains, careful adjustments must be made to insure proper temperatures in each storage compartment. The manufacturer largely controls this situation through designing and engineering practices at the factory.

(To be concluded next month)

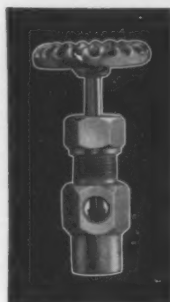
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All-Steel Line Valves
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Compact Design—Machined from bar stock steel—Full size parts — Completely rust-proofed—Highest grade graphite bab-bitt packing assures efficient operation and long life — All popular sizes.



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39 in. high
30 in. wide
6, 8 or 10 feet long

Beautiful stainless steel and polished aluminum outside with polished aluminum interior. Heavy duty fin-type coils give fast cooling and less frosting. Rugged construction, first quality materials. Stainless steel lids slide away or lift out. 8-inch utility shelf. Removable dividers inside. Toe space under edges.

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In our more temperate zone, however, the problem is more often how to keep cold *in*. Jamison has wrestled with this problem for more than half a century. As a result, Jamison-built Cold Storage Doors are designed to permit access to refrigerated spaces with the *minimum loss of cold*.

The development of Jamison Cold Storage Doors and related products has closely paralleled that of

the refrigeration, cold storage, and frozen food industries. Jamison's post-war line . . . comprising Jamison, Stevenson, Victor, and NoEqual Doors . . . is the most comprehensive in the world. "Jamison-built" is the hall-mark of expertly engineered and precision-built quality . . . in a field where the difference between the best and the ordinary may spell costly, continual trouble.

Look to Jamison for cold storage doors exactly suited to your needs. For full information about the complete Jamison line . . . and address of your nearest factory branch . . . write Jamison Cold Storage Door Company, Hagerstown, Maryland.

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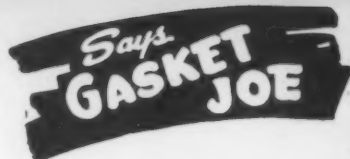
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COIL CLEANER

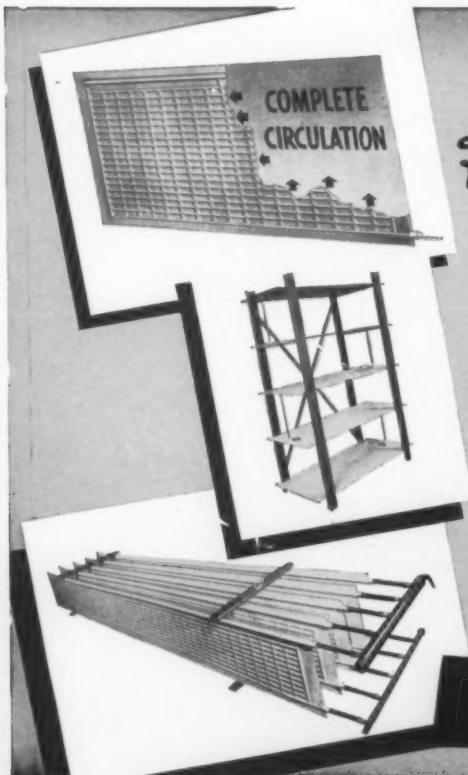
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For Complete Surface Freezing

HUBBELL-YODER REFRIGERATION PLATES

—and we mean "COMPLETE SURFACE."

Take a 19" x 108" Hubbell-Yoder Plate for example. That's 2052 square inches of plate area. And every single square inch is actual prime heat pickup surface. You see the interior of the plate is a network of ducts through which the refrigerant circulates, spreading out in all directions so as to form a web of refrigerating element. That's "Complete Surface Freezing."

If you make, sell or use low temperature equipment such as freezer cabinets, locker plant plate banks, sharp freeze shelf stacks, etc., it will certainly pay you to get details on Hubbell-Yoder Plates. They'll step up operating efficiency and reduce operating costs. As the old darkey said, "Dat am no prophecy: dat am a fact." Write, wire or phone.



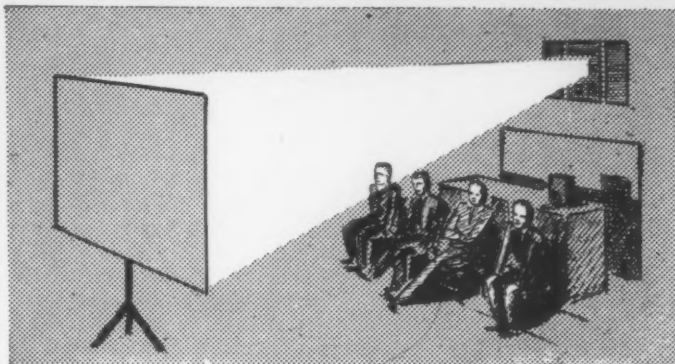
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THE REFRIGERATION INDUSTRY



This "hobby horse" runs IN THE MONEY

LUCKY indeed is the man who can make his hobby "double in brass" by serving his business as well as his leisure hours, and just such a man is J. David Braverman, owner and operator of Philadelphia's Official Service shop.

An ardent amateur movie enthusiast, Mr. Braverman has made this rather costly hobby pay out by using it to instruct his employees in more efficient service practices and procedures and to show them graphically just what makes certain types of equipment tick.

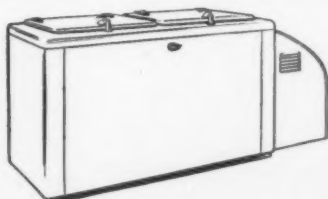
So convinced is Mr. Braverman of the merits of this method of instruction that he has built a compact but completely equipped projection room on a second-floor level over his office. Thus all he needs to do in order to have his own private "picture show" for his servicemen is to erect a screen near the front of the display room and switch on his twin 16 mm projectors.

Most of the films which Mr. Braverman uses for instruction purposes he obtains either from various equipment manufacturers or from the U.S. Office of Education, which has available a list of some 16 films dealing with refrigeration service. These films range all the way from the basic principles of heat transfer to the installation and repair of compressors and condensers.

To indulge his hobby even further, Mr. Braverman on occasion swings into Hollywood's typical "lights, camera, action" routine and tries his hand at producing his own service films.

FREEZER CABINETS

Available for prompt shipment, the new **SANITARY FREEZER CABINETS** will complement your finest condensing equipment. Heavily built, with steel welded frame, complete with freezer plates, cold controls, and expansion valve. Built for high efficiency at low operating cost. Requires only addition of condensing unit.



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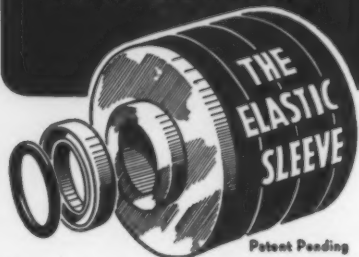
Name _____

Address _____

Occupation _____

Employed by _____ R-32

**COMPARISON
WILL PROVE
IT'S BETTER!**



"The Seal of Approval"

Write for Stock and Price List. Learn how you can save by eliminating "call backs".

TEMPERATURE
Control Devices
NEW HAVEN 15, CONNECTICUT



FIGURING on making some changes in your service shop or sales or office layout?

If you are—and lots of dealers are going right along with you—you'll be interested in a scale-model plan we heard about the other day. It's a scheme that can make the rearrangement job a whale of a lot easier to do, and quicker, too.

Most of us have stayed away from home as much as we could during housecleaning time, but we've all been stuck with a furniture-moving job every now and then. Shifting a davenport to a half-dozen locations before "the boss" finally decides it ought to go right back where it was in the first place isn't any fun; but wheeling big pieces of equipment

from one side of a shop to the other, unless you're sure that's where you want them, is really tough.

Have you ever got a piece of equipment all set up in a new location, and then found that there was no power line to connect it to? Brother, you're not alone. And that's only one oversight; you can count 'em by the dozens.

This scale-model plan we heard about is simple as sin; all you do, before you actually make any moves, is to draw a scale plan of your showroom or shop or office, and make scale-size models of the various items of equipment that are concerned. Your models for equipment pieces



"We're doing this as a special on all our February jobs."

can be cut from cardboard; they needn't be fancy.

You scale out your space, say, on the basis of 1 inch to 1 foot; maybe 1 inch to 2 feet. Then you can jiggle things around to your heart's content "on paper", so to speak, and nobody gets a headache out of it. After you've decided on the arrangement that suits you, all you have to do is to "freeze" the final set-up and have the equipment moved where you want it.

One thing you mustn't forget, though, is to include on your scale-model layout the location of the various electrical outlets; if you're using two types of current, be sure to note which is which. That way, there'll be less chance of your making a wrong "move".

No kidding, if you're in the moving mood, give this scale-model idea a try. It'll save you time and trouble.

NOW!

**FORGED FLARE NUTS
AND FITTINGS**

**Prompt Shipment
on Most Items**

Electrimatic

2100 INDIANA AVE
CHICAGO 16 ILLINOIS

A SURVEY of 30 St. Louis retail grocers selling frozen foods indicates that although all had found certain weaknesses in this phase of food merchandising, they will install new refrigerated equipment to enlarge their departments in the near future.

The survey covered stores ranging from large super markets to small neighborhood types, and was carried out in the interests of the George Lytle Co., frozen foods distributors in St. Louis.

Frozen food sales got a boost during the canned goods shortage, and have held their gains since then, the survey disclosed. Although some pre-cooked food items have been slow-movers up to now, frozen seafoods, meats and poultry were favorites with all 30 retailers. Chief customer objection—price—is steadily being outweighed by convenience of cooking and lack of waste, grocers reported.

Queried as to new equipment planned, every grocer stated that he needs walk-in or reach-in refrigeration storage space for large quantities of frozen foods, to prevent the "running out" daily which most reported. Likewise, each of them is planning to enlarge his selling equipment, utilizing either open-type reach-in boxes with blankets of cold air for refrigeration, or lid-type fitted with clear plastic lids showing the cases' contents. All of the stores said they intend to buy their own equipment rather than lease it from distributors.

WATER COOLER STANDARD IN EFFECT FEB. 1

Commercial Standard CS127-45, covering self-contained mechanically refrigerated drinking water coolers, will be effective for new production from Feb. 1, 1947, according to an announcement issued by F. E. Powell, of the Division of Trade Standards of National Bureau of Standards.



OPEN NEW PLANT

C. C. Puckett and M. H. Lewis have incorporated the Wilbarger Frozen Food Lockers, Inc., at Vernon, Tex., with \$10,000 authorized capital stock.

NEW DISTRIBUTOR

Thomas Store Equipment Co., 2480 Broadway, Gary, Ind., has been appointed York distributor for the Gary territory. Michael Thomas owns the company.

NEW CLINTON, MO., PLANT

The Kemper Packing & Locker Co., Inc., has been incorporated at Clinton, Mo., by J. H. Kemper, William H. Reich, Jessie Marjorie Delozier and Henrietta Keil, all of Clinton, with \$60,000 authorized capital stock.

LIMA NAME CHANGE

Modern Heating & Cooling Co. has changed its name to York-Lima Cooling Co., 450 S. Main St., Lima, Ohio. The firm is a York distributorship.

THERMOBANK



Means:

**LOWER TEMPERATURES
HIGHER EFFICIENCY
HIGHER HUMIDITY
ATTENTION-FREE OPERATION**

With the Thermobank, temperatures of 32° F. to -40° F. and below can be maintained as easily and with the same freedom from frost as temperatures of 40° F. in a conventional system. Operating with practically frost-free coils, Thermobank maintains the desired low temperatures with higher back pressures, less temperature differential between air and coils; and consequently higher humidity, less drying and more efficient compressor operation.

Essentially, the Thermobank System of Automatic Defrosting consists of a forced convection cooling unit, automatic time controls and a heat reservoir. A portion of the heat extracted during the refrigeration cycle is banked in the reservoir from which it is released to the refrigerant during the defrost cycle.

Send for Booklet 16-R1 explaining Thermobank System and including useful low temperature information and time-saving rapid selection tables.

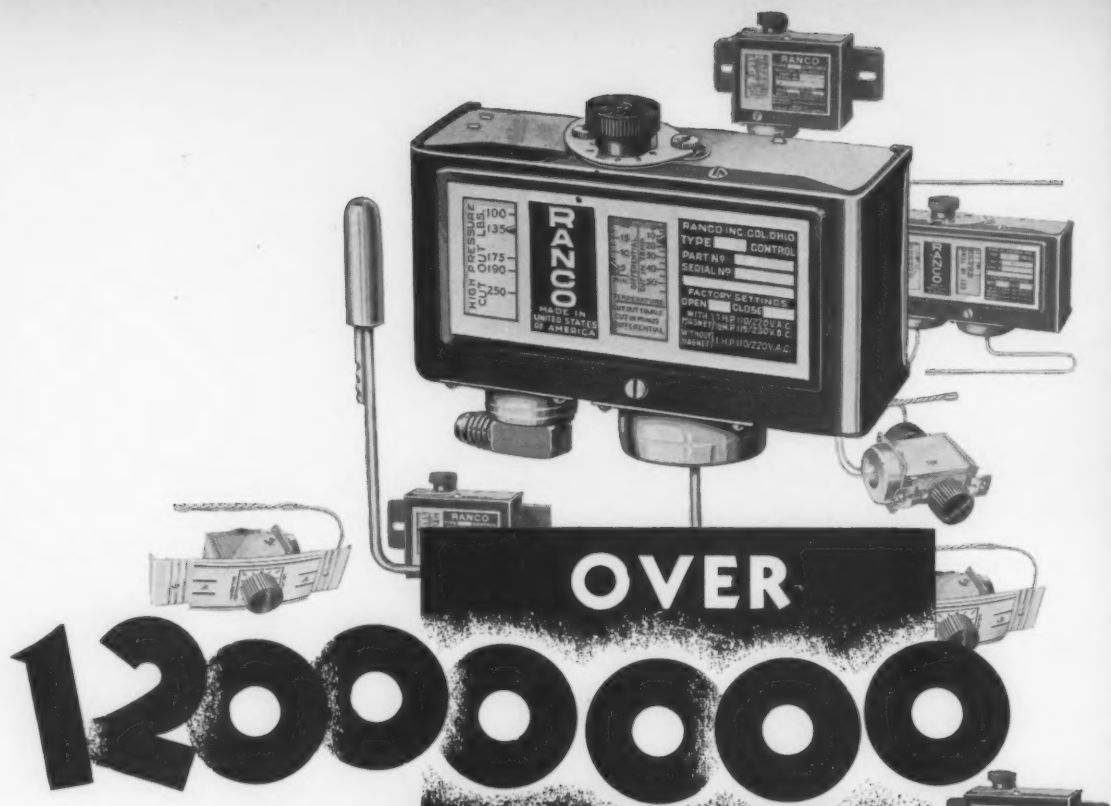
14

KRAMER TRENTON CO.

HEAT TRANSFER PRODUCTS

TRENTON 5 • NEW JERSEY





OVER 12000000

Ranco Controls TESTED BY USE in the Refrigeration Industry

For years the refrigeration industry has relied on Ranco Controls for every type of solid control — a faith that has been justified a million times over.

During these same years Ranco has assumed a natural leadership in the refinement of temperature and pressure controls . . . in the development of use of new and better materials . . . in achieving an ever increasing degree of precision operation.

Ranco Type "O" Commercial Controls, standard of quality in the industry, embody all Ranco developments. They provide a series of controls which accurately meet the requirements of commercial refrigeration.

Illustrated is Ranco O-1534 — a standard temperature control with high pressure cut-out. Low-est cut-out is —20°. Cut-in range is —15° to 40°. High pressure cut-out range is from 110 to 250 lbs. As in all Type "O" Controls cut-out and cut-in adjustments are changed together by a turn of the control knob.

See your Jobber and write for Bulletin No. 1042 on Ranco Type "O" Commercial Controls.

Ranco Inc.
COLUMBUS 1, OHIO

"Let's share our knowledge—exchange our experience"

Here's how

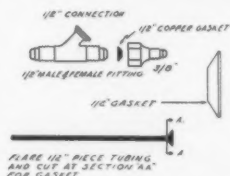
THE SERVICE MAN'S DEPARTMENT

Drilling Holes Through Glass

Occasionally the service man has need to drill holes through glass, particularly in those installations where glass partitions or shelves may be used and it becomes necessary to drill openings through which tubing, electrical wiring or drains may be passed.

When possible, it's always best to take the glass to an experienced cutter and have the work done there. Sometimes, however, the cutting must be done on the job, in which case the following suggestions may be helpful:

For cutting holes for tubing and electric wiring, a piece of brass or copper tubing having an outside diameter of the same size as that of the hole required will do the job. Revolve the tube at a peripheral speed of



I HAVE a suggestion which eliminates a certain difficulty in installations.

I am referring to the copper gasket, a trivial item often overlooked by the refrigeration man, but if it becomes necessary to install a male to female connection, they become very important.

Naturally, the size of connection being used determines the size of tubing used. They may be made in a few seconds, thus lessening the time and saving the cost of installation.

D. N. Miller, Sabina, Kan.

about 100 feet per minute and use carborundum 80 to 100 grit and light machine oil between the end of the

Edited by
Warren W. Farr

HELP WANTED

... By your fellow refrigeration service engineers. They can use your installation and applications ideas on refrigeration and air conditioning, your short cuts, shop practices, etc.

And there's money in it for you. REFRIGERATION INDUSTRY pays \$5 for each idea published. Send yours to

Here's How Editor
The Refrigeration Industry
1240 Ontario St.
Cleveland 13, Ohio

tube and the glass. The abrasive can be inserted with a thin piece of wood each time the drill is lifted, or the tube may be used as a reservoir to hold it.

While drilling, the glass should be supported by a felt or rubber cushion slightly larger than the hole to be drilled. Where possible, drill half way through, then turn the glass over and drill to meet the hole.

For drilling small holes through which to pass wire hangers, you can use an old three-cornered file ground to a long tapering point. Grip the file in a drill chuck and revolve rapidly. Use a mixture of turpentine and camphor as a lubricant.

Good Photos Can Help You Sell

In these columns last month, we mentioned what an aid to salesmanship a file of good installation photos could be. But before you rush out with some shutter-happy commercial photographer here are a few words of caution:

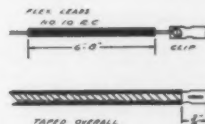
Taking pictures is expensive; so

determine beforehand what photos you want, and avoid taking those you won't be able to use.

By and large, "routine" installation pictures made in a cluttered basement or back room aren't much use, unless they typify unusual ingenuity in getting the installation into a difficult space. However, when equipment is installed in a place of honor, where visitors are invited, it may be worth a photo. In such instances, include some of the surroundings; don't "shoot" a close-up of the equipment alone.

Show the "use" of the equipment, if you can do it without sacrificing the quality of the picture. You're interested, most of all, in showing the type of establishment that uses your product.

Don't concentrate on the large,



I HAVE a method of making test clips from old appliance plugs that has been very useful to us here.

Use the terminal contact clips out of standard appliance plugs. Use a short 6 or 8-inch piece of #10 solid R. C. wire as a handle. Connect a clip on one end of #10 wire and a flexible cord to the other. Tape over all except about 3/4" of the clip.

These clips fit easily and quickly and make good firm connections on terminals, pins and attachment plug blades of most all appliances.

They are very handy to use on refrigerator motors and work very well as prods.

W. E. Thompson, Augusta, Ga.

fancy places. Often the smaller, less pretentious places tell better picture stories than the whopping big ones.

You'll be tempted to have a number

of photos of each job taken—but don't do it! Try to select the *one best shot*. And make that shot a good one. Make it tell the story for you.

Finally, don't neglect to get from the user a brief testimonial as to how the equipment has served him. The photo-and-letter combination packs a powerful sales punch. And if you have in mind using the photos in advertising or publicity, get the user's o.k. *beforehand*.

How to Make Belts Last Longer

V belts give long service with but little attention. It is important, however, to be sure that the motor and compressor pulleys are accurately lined up, especially after replacing the motor, also that the belt has the proper tension which permits about $\frac{1}{2}$ " to $\frac{3}{4}$ " "up and down" movement.

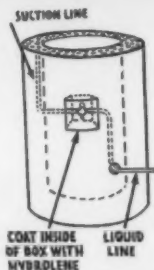
To adjust belt tension loosen the screws holding the motor base to the frame of the condensing unit, pulling the motor away from the compressor to tighten the belt, and afterwards tightening the screws again. Too loose a belt may slip and be noisy; too tight a belt will impose extra load on the motor, besides causing increased bearing wear in the compressor and motor. Don't attempt to repair a broken or damaged belt; replace it.

TOP & BOTTOM PIECES 2 EACH

SHAPE OF SPACE
BETWEEN TANK
AND FRAME

SIDE PIECES HAVE
SLOTS FOR TUBING

2 EACH
SLIGHTLY
LARGER SLOT
FOR SUCTION
LINE



HERE is a problem I had with a frozen food cabinet. The trouble was that air and moisture seeped through the inspection plate. The cold TXV caused the moisture to freeze and during a period of time it broke down the insulation. The result was that the tank had to be pulled out, all insulation replaced, and the bottom block, being solid, had to be dried out as it was impossible to get the solid piece to support the tank.

The way I cured this trouble is as follows:

1. Place large round block of insulation that is the original material in the bottom of case and coat with Hydrolene.

2. Replace tank in original position.

3. Pack around tank rock wool pellets, up as far as $\frac{3}{4}$ " below inspection plate opening.

4. Build a box out of four pieces of $\frac{3}{4}$ " thick pressed insulating board. The size of the window gov-

erns the length to cut the insulating board, and the distance between outside frame and tank governs width of the insulating board.

a. Cut slots for tubes in side pieces.

b. Cut top and bottom pieces shape of tank and case.

5. Install pieces as the diagram shows and cover inside with hydro-lene (also fill tube slots) and then finish packing case with rock wool and replace top cover. Then fill inspection opening with rock wool and replace inspection plate.

With the thermostatic valve insulated and watertight from the rest of the box, any condensation in this area will only run out the side of the cabinet and do no harm, whereas the old setup let the water break all the insulation down in the unit. The small amount in the sealed box can be replaced easily if it becomes soaked.

J. C. Robinson, McKeesport, Pa.

EXCLUSIVE NATIONAL DISTRIBUTOR
THE HARRY ALTER CO. 1728 S. MICHIGAN AVE.
CHICAGO 16, ILLINOIS
JOBBER: WRITE FOR SPECIAL PROPOSITION!

Frozen Foods Temperature Guide

The temperature determines the time products may be stored in a freezer locker without loss in quality, experiments have shown. Best results are obtained in storing at 0° to 5° F. There is no particular advantage in storing at below zero.

Micro-organisms dangerous to health will not grow below 14° F. Botulinus toxin has not been known to develop below 40° F.

Here, for your information, are figures on the approximate length of storage, by months, of some of the more common products:

	Zero	5°	10°
Fruits, beef, vegetables . . .	10-12	8-10	3-4
Poultry, eggs, lamb, mutton . .	8-10	6-8	3-4
Veal, pork, butter	6-8	4-6	2-3
Ground meat (unsalted) . . .	4-6	3-4	2-3
Fish	3-4	2-3	1-2

Pork, fish, ground meat and cut poultry keep longer if packed in tough, moisture-resistant materials.

THE REFRIGERATION INDUSTRY

ABOUT PEOPLE . . .
Continued from page 41

company plans. He handled refrigeration and laundry equipment advertising for Westinghouse for four years prior to his entry into military service in 1941.

Three new district managers in the direct sales division have been named by Carrier Corp. They are: **W. S. Bodinus**, Chicago; **J. H. Bailey**, Cleveland; **W. H. Steitler**, Dallas. Appointment of **Walter F. Jones** as centrifugal gas compressor specialist for the company also has been announced. He will make his headquarters in New York City.

S. T. Rose has been appointed director of industrial relations of Universal Cooler Division, International Detrola Corp. Mr. Rose comes to Universal following a three-year association with Ranco, Inc., where he was a personnel director, director of contract termination, and also in

charge of government contract renegotiations.

L. A. Iserman has been appointed manager of the Cincinnati branch of General Electric Appliances, Inc. He succeeds **P. C. Wilmore**, who has resigned. Since his discharge from the Army Air Forces last year, Mr. Iserman has been sales manager of the Cincinnati branch.

H. A. Valencourt, former Pittsburgh zone manager for Kelvinator Division, Nash-Kelvinator Corp., has been appointed eastern regional manager of the division, succeeding the late **Steele R. Sellers**. The Pittsburgh post will be filled by **Laurence A. Conlin**, former household sales manager in that zone.

Carl J. Anderson has been appointed Seattle district sales manager for the Deepfreeze Division, Motor Products Corp. **Miss Geraldine Corman** has been named director of the division's home economics department.

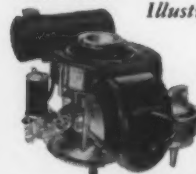
LIGHTWEIGHT GASOLINE ENGINES

New Source for Engines

McCulloch Motors Corp., in a new plant covering 75,000 sq. ft., is mass-producing die-cast light-weight gasoline engines. Current production includes 2-cycle models from 2½ to 4 hp.

Design Features: Separate pressure oil system eliminates need to mix oil with gas; patented "reverse-flow" scavenging improves starting and idling; fuel injection optional on some models.

Illustrated brochure available



**TYPICAL SERIES
1200 ENGINE**

Model 1200D, developed for vertical-power drives. Develops 2.5 hp at 2500 rpm rated speed, yet weighs only 24 pounds.



6101 WEST CENTURY BLVD.
LOS ANGELES 45, CALIF.

MINERALLAC "DUPLEX"

JIFFY CLIPS

Do it Faster . . . Better!



Millions of "Duplex" Jiffy Clips have set an unsurpassed service record for installing hanging pipe, conduit, B-X cable, coils, condensers, etc. One bolt or screw holds this ribbed clip. In zinc-plated steel or Everdur alloy.

SEND FOR LITERATURE
AND PRICES

Specify
MINERALLAC
HANGERS, CLIPS,
STRAPS, BUSHINGS

MINERALLAC ELECTRIC CO.
25 North Peoria Street
Chicago 7, Illinois

MINERALLAC

Eston

Refrigerants Have These ADVANTAGES At No Extra Cost To You!

①

Lowest moisture content.

②

Individual cylinder tests
and factory guarantees.

③

Banded cylinders for easy
identification.



Blue band—
SULPHUR DIOXIDE

Red band—
METHYL CHLORIDE

Also—
METHYLENE CHLORIDE

and **FREON 11-12-22-113**

Eston Refrigerants are sold exclusively through recognized jobbers and distributors.

Formerly
Pittsburg Chemical Co.

Eston

CHEMICALS, INC.

3100 E. 26TH ST., LOS ANGELES 23, CALIF.

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The MARKET Place

Rates: for "Positions Wanted" \$3.50 minimum, limit 25 words. For all other classifications \$3.50 minimum for 25 words, each additional word 10c; bold-face type or all capitals, \$6.00 minimum for 25 words, each additional word 15c; limit 50 words. Box addresses count as five words. All insertions are payable in advance.

REPRESENTATIVES WANTED

Progressive electrical manufacturer of parts sold by refrigeration jobber expanding sales program which will require representatives in following territories:

Oregon, Washington
Texas, Oklahoma, Louisiana, Arkansas
Alabama, Tennessee, Mississippi, Georgia
North Carolina, South Carolina, Virginia

If interested, indicate lines now represented. Address Box 1147, Refrigeration Industry.

FOR SALE

NEW CUPRO-NICKEL TUBES

100,000 lbs. 1/2" O.D. x 18 ga. Wall
70% Copper - 30% Nickel
80 3/4"

Soft - Can Be Flared or Coiled
Suitable for Refrigeration and Oil Work
Seaboard Steel Co., New Haven, Conn.
Telephone: 8-0929 8-2034

FOR SALE—Air-cooled & Water-cooled, remanufactured condensing units, 1/4 up to 2 H.P. Write for particulars, Edison Cooling Corp., 310 East 149 St., Bronx 51, N. Y.

Immediate Delivery Freezers, open and closed glass top, stainless steel top, canopy type, 20-44 cu ft. Florist, Dairy boxes, bottle coolers, double duty display cases. Ice Cream cabinets, storage boxes, wood-metal. 4-6 can milk coolers, reach-in refrigerators. Water fountains. Frigitemp Corp., 931 Bergen St., Brooklyn 16, N. Y. Main 2-9093.

For Sale at Liberal Discount:

Unger Flaring and Tube Cutting Machine, Complete With Collets and Extra Saws. Used only few months, guaranteed same as new. Air Loc Industries, 353 Loeb Arcade, Mpls. 2, Minn. Phone Lincoln 4224.

Refrigeration Repair stock and tools. Tubing, fittings, valves, gauges, etc. All practically new. Cost \$300. Sell for \$200. Schuder Electric Co., Sumner, Illinois.

FOR SALE: 12 - 16 - 19 - 22 and 26 cubic foot freezer cabinets. Write for list and prices. Rathbun Refrigeration Company, 325 Scribner Ave., N.W., Grand Rapids, Michigan.

EQUIPMENT WANTED

We buy, sell, trade household and commercial refrigeration compressors, coils, tubing, motors, A.C.-D.C., Farm lighting plants. Give complete details. Write Myers Electric, Manitowoc, Wis.

LOOMING BIG IN THE MODERN AMERICAN LIVING SCENE....



The BEN-HUR Farm & Home Freezer

Engineered and designed to bring the health-building benefits of fresh-frozen foods to the American family. Hundreds of thousands of new homes now planned and building are present prospects for a generous-size, dependable, quality-built BEN-HUR Farm and Home Freezer.

Service-wise dealers, anticipating increased customer good-will and confidence will feature and recommend the new "BEN-HUR" for these "Stand-Out" Quality Features.

- All Steel Construction
- Lifetime Tested
- All Food Surrounded by Cold
- A Size for Every Family
- Thick Insulation (Hermetically Sealed)
- Modern, Smart Design
- Economy-Engineered

BEN-HUR MFG. CO.

Continuous Manufacturing Since 1911

Dept. R. 634 E. Keefe Ave., Milwaukee 12, Wis.

BEN-HUR

FARM & HOME FREEZERS

Your service work is easier...
because  Refrigeration Valves are *Dependable*



ONE model 270 Solenoid takes the place of EIGHT in your service kit

With its Dual Voltage Coil and other unique construction features, Model 270 Solenoid, rated up to 18.5 tons Freon, offers unusual flexibility in application. For instance, the SAME solenoid can be used for: 115 or 230 volts — 50 or 60 cycles — either $\frac{5}{8}$ " or $\frac{3}{8}$ " tubing. You would need EIGHT VALVES in your kit to cover ALL these conditions handled by ONE A-P Model 270 Solenoid.


A-P DEPENDABLE Model 270 Solenoid, with its simple, positive "Pilot Operation" requires only minimum power. Pressure holds the valve tightly shut. When current is applied, the plunger is pulled part way up, opening the pilot port and allowing pressure to leak to the pressure side. Then, with pressure above the piston reduced, the pressure below the piston opens the main valve port. The plunger, moving on upward, holds the piston away from the port, requiring no pressure drop to hold the valve open. A three-point stop, used in conjunction with a "shading coil" makes operation quiet and vibrationless. Manual opening stem is provided for use in case of current failure.

If you haven't already used the DEPENDABLE A-P Model 270 Solenoid to make your work easier, ask your jobber about it now — or write for bulletin No. 403.

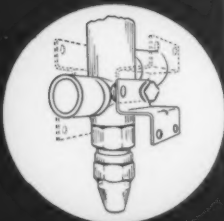
AUTOMATIC PRODUCTS COMPANY

2486 NORTH THIRTY-SECOND STREET • MILWAUKEE 10, WISCONSIN
EXPORT DEPT. 13 E. 40TH STREET, NEW YORK 16, N. Y.



 Model 270 Solenoid Refrigerant Valve
With DUAL VOLTAGE COIL for 115-230 volts, 50-60 cycles.
Capacity, liquid line, 18.5 tons Freon, 46 tons Methylol Sulphur.

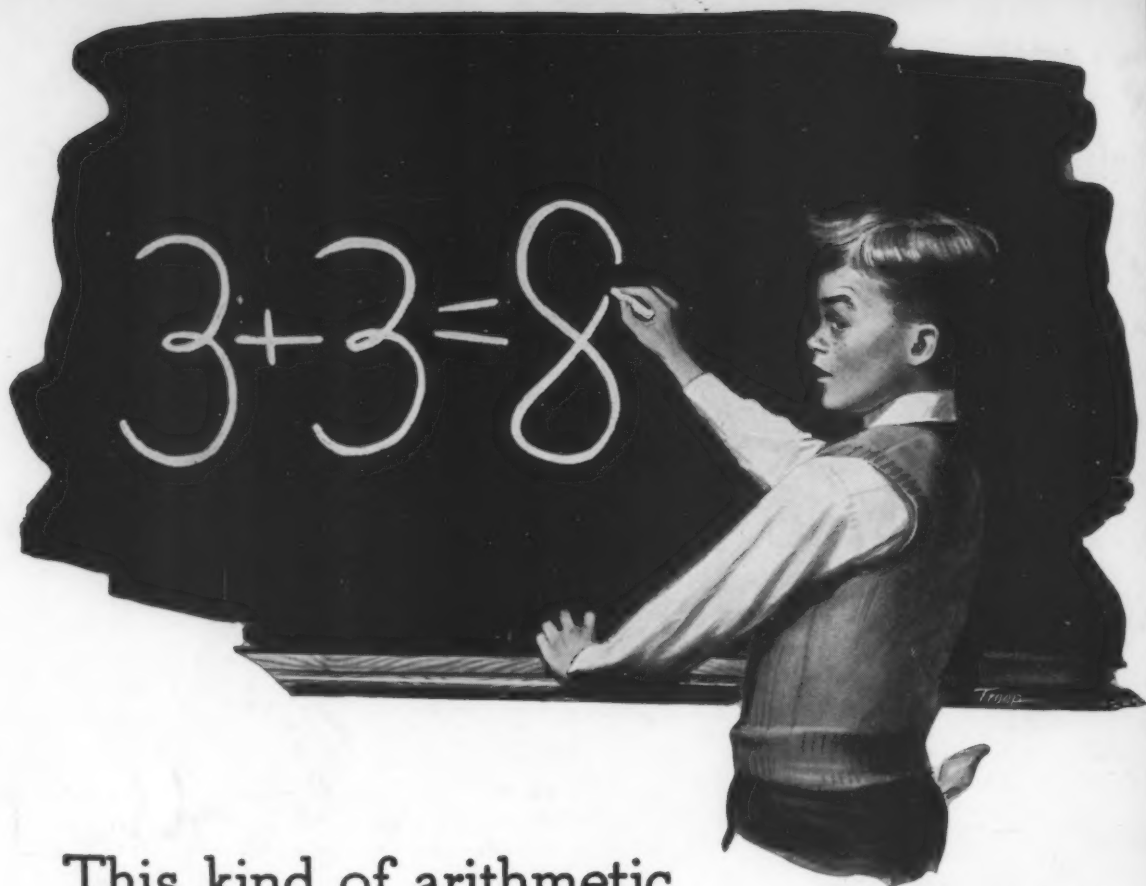
Handy bracket permits simple, rigid mounting in any of several positions.



Dependable

REFRIGERANT VALVES

FOR REFRIGERATION SERVICE ENGINEERS



This kind of arithmetic may put Johnny through college

Here's how it works out:

**\$3 put into U. S. Savings Bonds today will
bring back \$4 in 10 years.**

Another \$3 will bring back another \$4.

So it's quite right to figure that 3 plus 3 equals
8 . . . or 30 plus 30 equals 80 . . . or 300 plus
300 equals 800!

It will . . . in U. S. Savings Bonds. And those

bonds may very well be the means of helping
you educate your children as you'd like to have
them educated.

So keep on buying Savings Bonds—available
at banks and post offices. Or the way that mil-
lions have found easiest and surest—through
Payroll Savings. Hold on to all you've bought.

You'll be mighty glad you did . . . 10 years
from now!

SAVE THE EASY WAY...BUY YOUR BONDS THROUGH PAYROLL SAVINGS

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